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SAMS PHOTOFACT* SET No. 380

*TRADEMARK

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	MODEL	SET AND FOLDER No.
PRODUCTION CHANGE BULLETIN		
Admiral	T101, T102, T103, T104, T105AL, T106AL, T107AL, T140, T141, T142, T143, T144AL, T145AL, T1010, T1011AL, T1012AL, T1013AL (Ch. 14YP3B, BK, C) Tel. Rec.	380-1
Sentinel	Chassis V20-01AA, V20-02AA, V20-03AA	380-1
Wells-Gardner	321A62U-C-612, 321A62U-C-672, 321A62U-D-612, 321A62U-D-672, 321N62-C-612, 321N62-C-672, 321N62-D-612, 321N62-D-672, 2321A62U-C-614, 2321A62U-C-674, 2321A62U-D-614, 2321A62U-D-674, 2321N62-C-614, 2321N62-C-674, 2321N62-D-614, 2321N62-D-674 Tel. Rec.	380-1
Knight	99RZ176 Recorder	380-1
TELEVISION RECEIVERS		
Admiral	T323B1B (Ch. 20Z4EFB, FFB, PSB)	380-2
Hoffman	B3234, U, B3261, U, B3271, U, B3304, U, M3234, U, M3261, U, M3271, U, M3304, U, P3234, U, P3261, U, P3271, U, P3304, U (Ch. 331, U)	380-3
Silvertone	6102, 6103 (Ch. 549.20040, 549.20050)	380-4
Trav-Ler	721-K-120, U, 721-K-765, U, 721-K-767, U, 721-LP-800, U, 721-MT-110, U, 721-T-111, U, 721-T-760, U, 721-TL-112, U (Ch. 835-17, 836-17, 837-17, 838-17)	380-5
OTHER EQUIPMENT		
David Bogen	R620	380-6
Electro-Voice	3303	380-7
Grommes	212	380-8
Harmon-Kardon	TA-1040	380-9
H. H. Scott	121-C	380-10
Silvertone	8070, 8072 (Amp. Ch. 528.59040, 528.59041, 528.59060, 528.59061, Transport Ch. 528.58010, 528.58011, 528.58030, 528.58031) Recorder	380-11

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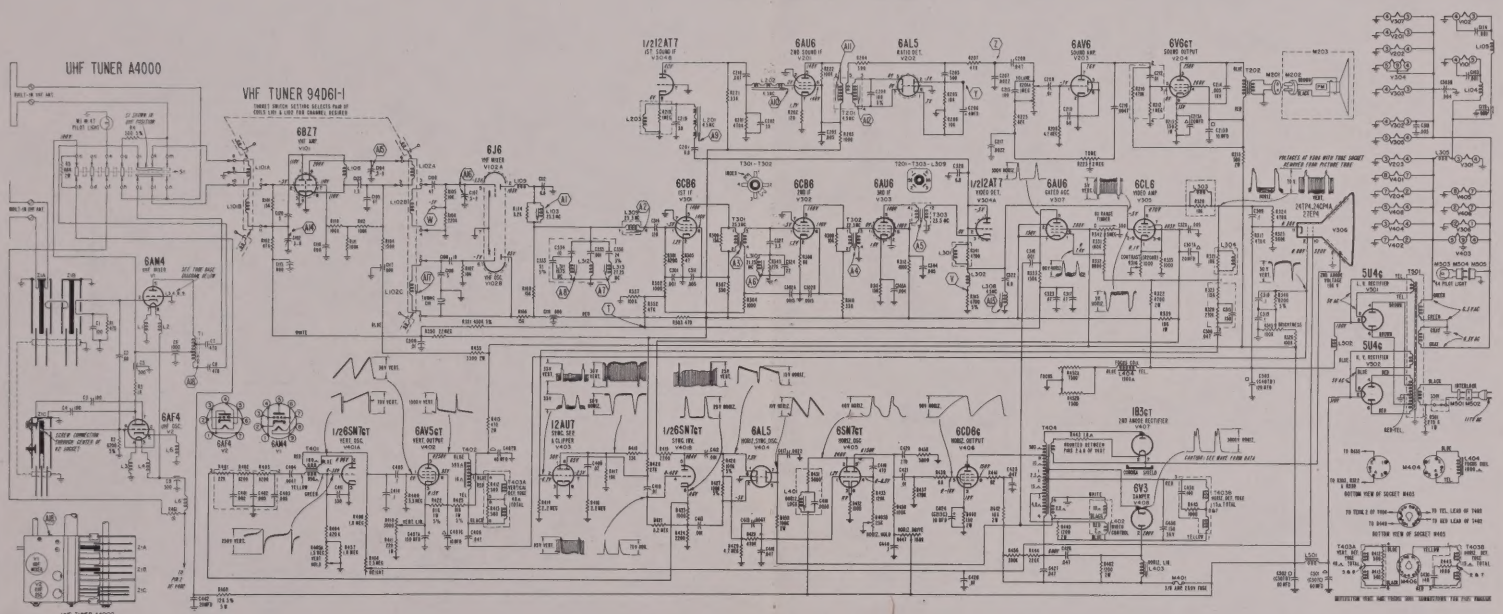


V1 —6AM4
V2 —6AF4
V101—6BZ7
V102—6J6
V201—6AU6
V202—6AL5
V203—6AV6
V204—6V6GT
V301—6CB6
V302—6CB6
V303—6AU6
V304—12AT7
V305—6CL6
V306—24TP4/24CP4A, 27EP4
V307—6AU6
V401—6SN7GT
V402—6AV5GT
V403—12AU7
V404—6AL5
V405—6SN7GT
V406—6CD6G
V407—1B3GT
V408—6V3
V501—5U4G
V502—5U4G

Admiral Ch. 23C1, 23F1

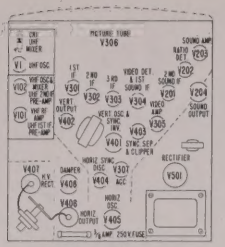
Schematic Diagram Courtesy of the Admiral Corp.

The PHOTOFACT Servicer

Set 380
Vol. 38

★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Dec. 1, 1957

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.



CR1—1N82A or 1N124
V1 —6AF4
V101—6BZ7
V102—6U8
V201—6AU6
V202—6AL5
V203—6AV6
V204—6V6GT
V301—6CB6
V302—6CB6
V303—6CB6
V304—12AT7
V305—12BY7
V306—21ZP4B
V307—6AU6
V401—6SN7GT
V402—6S4
V403—6CS6
V404—6AL5
V405—6SN7GT
V406—6BQ6GT
V407—1B3GT
V408—6AX4GT
V501—5U4G

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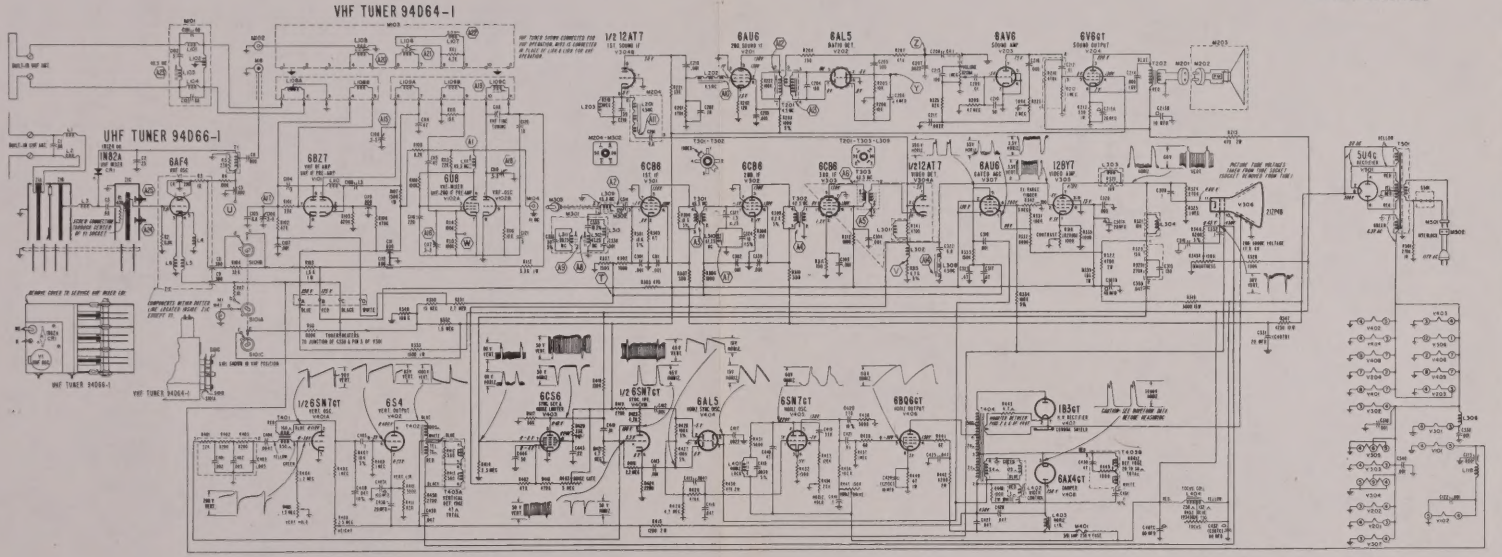

Admiral Ch. 22H3Z, 22J2Z

Schematic Diagram Courtesy of the Admiral Corp.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 350

ADMIRAL MODELS T101, T102, T103, T104, T105AL, T106AL, T107AL, T140, T141, T142, T143, T144AL, T145AL, T1010, T1011AL, T1012AL, T1013AL (Ch. 14YP3B, BK, C)

Admiral Models T101, T102, T103, T104, T105AL, T106AL, T107AL, T140, T141, T142, T143, T144AL, T145AL, T1010, T1011AL, T1012AL and T1013AL (Ch. 14YP3B, BK, C) were covered in Photofact Folder 1 — Set 350.

The following changes were made during late production.

TO MAKE SYNC CIRCUITS NON-CRITICAL DUE TO TUBE VARIATION

A 22MMF, N750 ceramic disc capacitor is added from pin 3 of V5B (Sync Sep.) to ground.

A 10,000MMF @ 450V ceramic disc capacitor is added between pin 3 of V5B (Sync Sep.) and pin 9 of V6B (Sync Phase Inverter).

A 1.8Meg, ½ watt resistor is added between pins 8 and 9 of V6B (Sync Phase Inv.).

A 2.2Meg, ½ watt resistor is added from pin 9 of V6B (Sync Phase Inv.) to ground.

R47 is decreased from 47K to 27K.

R48 is decreased from 330K to 150K.

R62 is decreased from 3300Ω to 1500Ω.

R60 is decreased from 6800Ω to 3300Ω.

R61 is decreased from 3300Ω to 1500Ω.

R63 is omitted.

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TO COMPLY WITH FCC REGULATIONS AS TO RADIATION

C67 is omitted.

A .047MFD @ 1000V capacitor is added across the AC interlock plug.

An RF choke (part #73B31-1) is added from one side of the AC line to the junction of R82 and R83.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11 IN SET 367

SENTINEL CHASSIS V20-01AA, V20-02AA, V20-03AA

Sentinel Chassis U72-01AA, U72-02AA, V72-01AA, V72-02AA (72 Series) were covered in Photofact Folder 11 — Set 367.

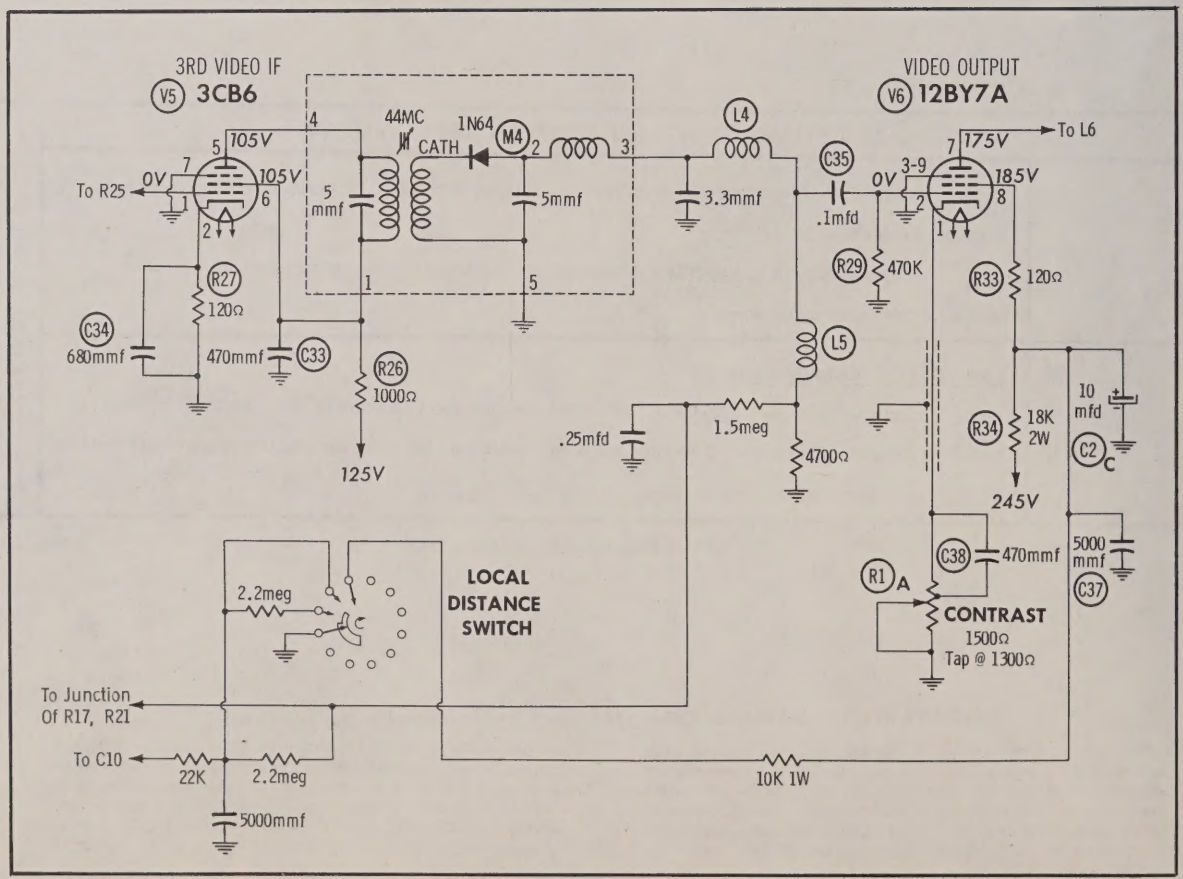
Chassis V20-01AA, V20-02AA, V20-03AA are electrically identical to the chassis covered except for the following changes.

NEW VIDEO IF AND AGC CIRCUITS

Chassis V20-01AA, V20-02AA, V20-03AA does not use V7A and V7B (AGC Keying, 1st. Sync Amp.). A locality switch and AGC network are used. A partial schematic showing the new Video IF and AGC circuit is given on the reverse side.

(Continued on Reverse Side)

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America


3RD VIDEO IF
V5 3CB6
VIDEO OUTPUT
V6 12BY7A
44MC
1N64
M4
CATH
L4
C35
To L6
105V
175V
185V
0V
To R25
5 mmf
5mmf
3.3mmf
.1mfd
R29 470K
R33 120Ω
R27 120Ω
C34 680mmf
470mmf C33
R26 1000Ω
125V
L5
.25mfd
1.5meg
4700Ω
10 mfd
C2C
R34 18K 2W
245V
C38 470mmf
5000 mmf
C37
R1A
CONTRAST
1500Ω
Tap @ 1300Ω
LOCAL DISTANCE SWITCH
2.2meg
To Junction Of R17, R21
To C10
22K
2.2meg
5000mmf
10K 1W

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 19 IN SET 369

WELLS-GARDNER MODELS 321A62U-C-612, -672, 321A62U-D-612, -672, 321N62-C-612, -672, 321N62-D-612, -672, 2321A62U-C-614, -674, 2321A62U-D-614, -674, 2321N62-C-614, -674, 2321N62-D-614, -674

Wells-Gardner Models 321A62U-A-612, 321A62U-A-672, 321N62-A-612, 321N62-A-672, 2321A62U-A-614, 2321A62U-A-674, 2321N62-A-614 and 2321N62-A-674 were covered in Photofact Folder 19 — Set 369.

Models 321A62U-C-612, 321A62U-C-672, 321A62U-D-612, 321A62U-D-672, 321N62-C-612, 321N62-C-672, 321N62-D-612, 321N62-D-672, 2321A62U-C-614, 2321A62U-C-674, 2321A62U-D-614, 2321A62U-D-674, 2321N62-C-614, 2321N62-C-674, 2321N62-D-614 and 2321N62-D-674 are electrically identical to the models covered except for the following changes.

CORRECTION

Models 321N62U-A-612, 321N62U-A-672, 2321N62U-A-614, 2321N62U-A-674 covered in Photofact Folder 19 — Set 369 should have been listed as 321A62U-A-612, 321A62U-A-672, 2321A62U-A-614, 2321A62U-A-674.

321A62U-C-612, 321A62U-C-672, 321N62-C-612, 321N62-C-672, 2321A62U-C-614, 2321A62U-C-674, 2321N62-C-614, 2321N62-C-674

VIDEO IF TUBES CHANGED

V3 (1st. Video IF) and V4 (2nd. Video IF) are changed from 3CB6 to 3BZ6.

COMPONENT CHANGES

C39 is removed and replaced with a dual ceramic capacitor, each section 1000MMF @ 500V. The "A" section is connected from the junction of R19, R20, R24 to ground and the "B" section is connected from R22 to ground.

R20 is omitted.

A 150Ω, ½ watt resistor is added from the junction of R19 and R24 to the 125 voltage source.

In VHF models only, R83 is decreased from 1700Ω to 1300Ω.

In VHF/UHF models only, R83 is decreased from 2500Ω to 2000Ω.

R35 is increased from 47Ω to 68Ω.

321A62U-D-612, 321A62U-D-672, 321N62-D-612, 321N62-D-672, 2321A62U-D-614, 2321A62U-D-674, 2321N62-D-614, 2321N62-D-674

TO COMPLY WITH FCC REGULATIONS AS TO RADIATION

V13 (horizontal output) V14(damper) are relocated in the filament string. V11 becomes the first tube in the filament string and V14 and V13 are connected between pin 1 of V16 and pin 3 of V1.

C75 is omitted.

A .22MFD @ 400V capacitor is added across the AC interlock.

T1 (pilot light transformer) is changed to part #54X18.

PICTURE TUBE CHANGED

V16 (picture tube) is changed from 21ATP4 to 21BTP4.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 366

KNIGHT MODEL 99RZ176

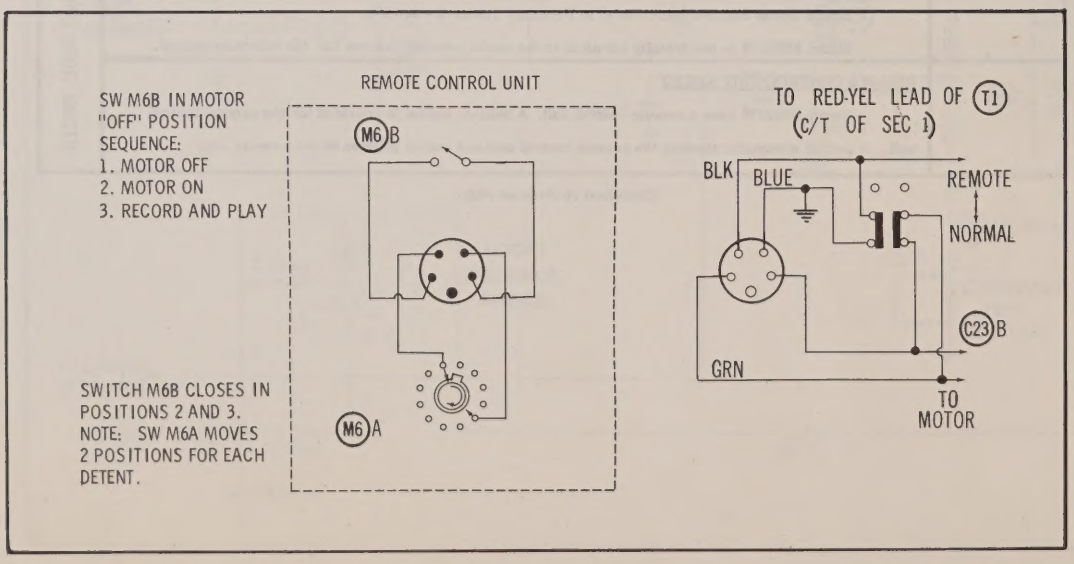
Knight Model 96RZ940 was covered in Photofact Folder 5 - Set 366.

Model 99RZ176 is electrically identical to the model covered, except for the following change.

REMOTE CONTROL UNIT ADDED

Model 99RZ176 uses a remote control unit. A built-in socket is provided for the remote control unit. A partial schematic showing the remote control unit and socket is given on the reverse side.

(Continued on Reverse Side)


SW M6B IN MOTOR "OFF" POSITION SEQUENCE:
1. MOTOR OFF
2. MOTOR ON
3. RECORD AND PLAY
SWITCH M6B CLOSES IN POSITIONS 2 AND 3.
NOTE: SW M6A MOVES 2 POSITIONS FOR EACH DETENT.
REMOTE CONTROL UNIT
M6 B
M6 A
TO RED-YEL LEAD OF T1
(C/T OF SEC 1)
BLK
BLUE
REMOTE
NORMAL
C23 B
GRN
TO MOTOR

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

ADMIRAL
MODEL T323B1B (Ch. 20Z4EFB, FFB, PSB)

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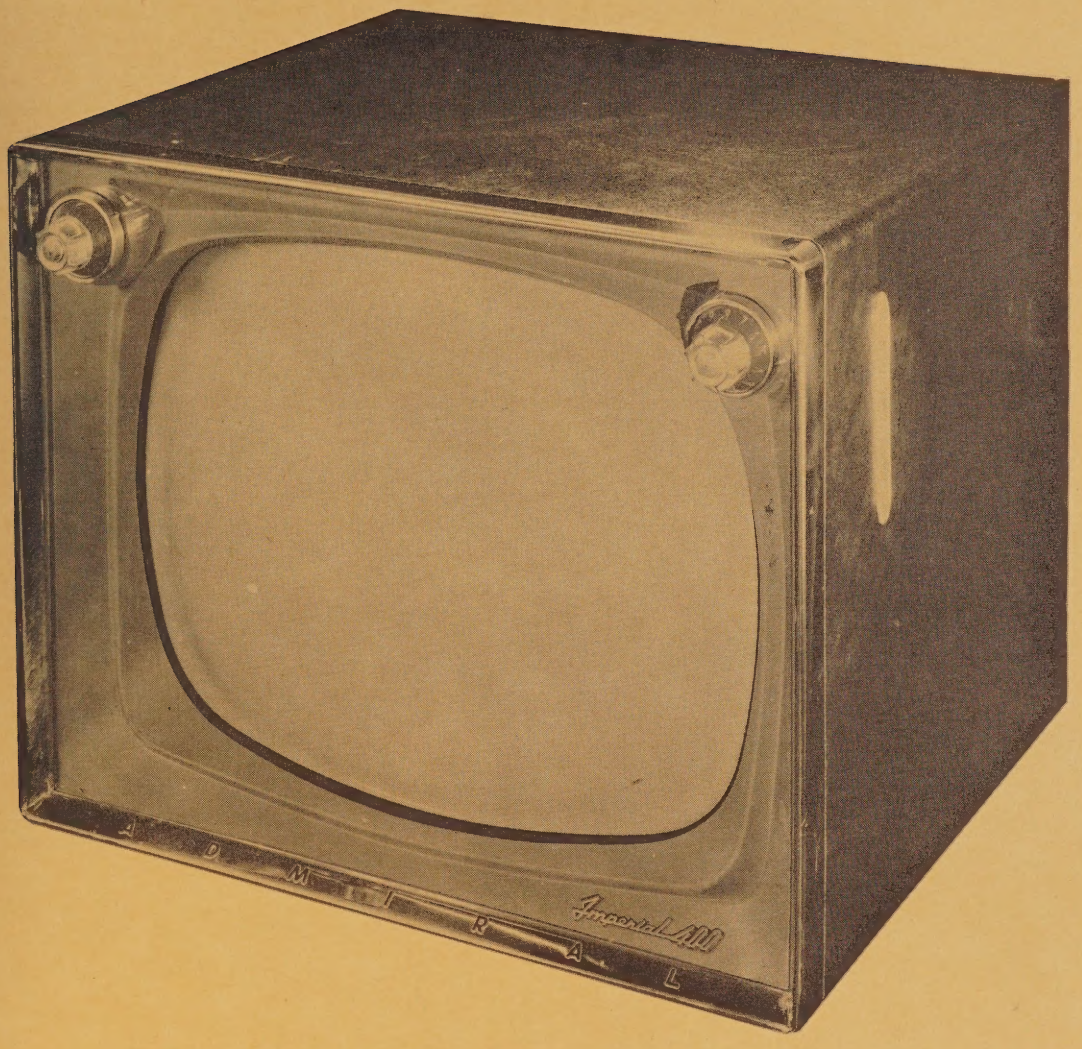

ADMIRAL
MODEL T323B1B (Ch. 20Z4EFB, FFB, PSB)

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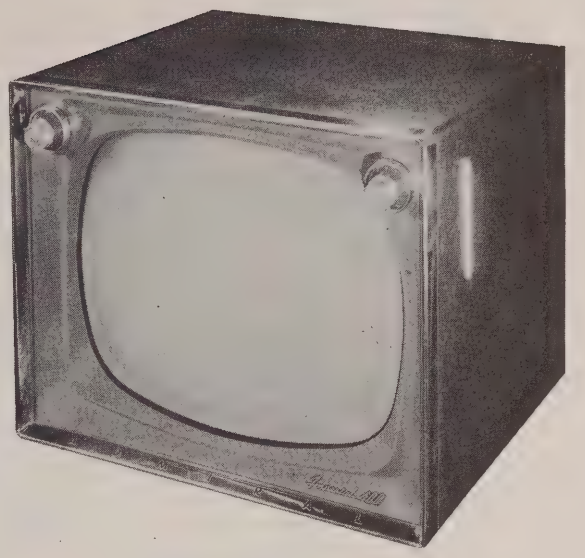
FOLDER 2

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type knobs from the front.
2. Release 6 clamps and remove the rear cover.
3. Remove 2 metal screws and side control escutcheon.
4. Remove 2 metal screws under escutcheon and remove control bracket.
5. Remove volume and contrast controls by depressing 2 spring clips.
6. Remove picture tube socket, ion trap, yoke clamp, yoke, HV lead and speaker plug.
7. Remove 2 metal screws and AC interlock.
8. Remove 1 metal screw holding the top chassis brace.
9. Remove 4 chassis bolts from the bottom.
10. Remove chassis.
11. Remove 2 speaker nuts. Remove speaker and output transformer.



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TRADE NAME	Admiral	MODEL	CHASSIS
			20Z4EFB
			20Z4FFB
		T323B1B	20Z4PSB
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver		
TUBES	Twenty		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING	180 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 push-on type knobs.
Remove 3 metal screws from the bottom of the front.
Pull the bottom of the front out and down to remove assembly

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 2 and 6 and 10. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A10) located on top of chassis.

FUSES

One fuse is used for LV power supply protection.
(For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ADMIRAL
MODEL T323B1B (Ch. 20Z4EFB, FFB, PSB)

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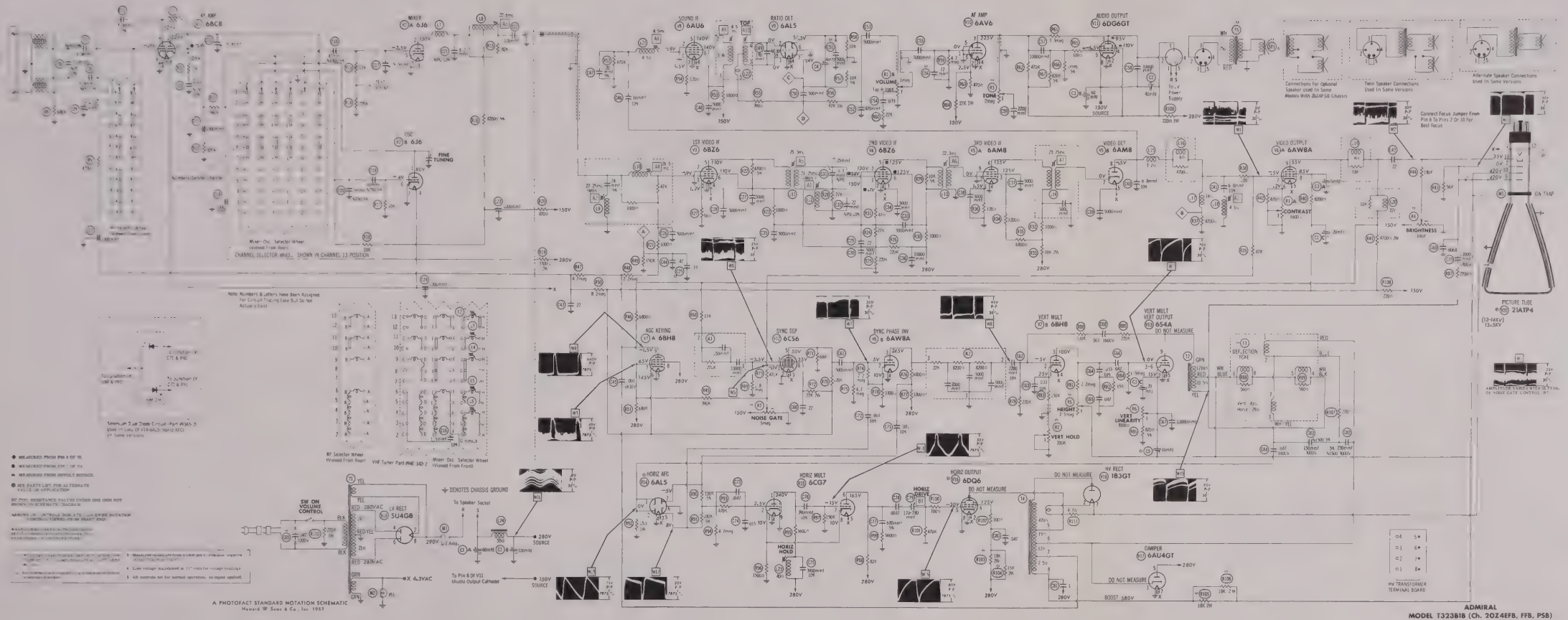
RF AMP
6BC8
MIXER
1/2 6J6
OSC
1/2 6J6
FINE TUNING
SOUND IF
6AU6
RATIO DET
6AL5
TONE
AF AMP
6AV6
AUDIO OUTPUT
6DG6GT
VOLUME
1st VIDEO IF
6BZ6
2nd VIDEO IF
6BZ6
3rd VIDEO IF
6AM8
VIDEO DET
6AM8
VIDEO OUTPUT
6AW8A
CONTRAST
BRIGHTNESS
PICTURE TUBE
21ATP4
AGC KEYING
6BH8
SYNC SEP
6CS6
SYNC PHASE INV
6AW8A
NOISE GATE
VERT MULT
6BH8
VERT MULT
VERT OUTPUT
6S4A
DO NOT MEASURE
HEIGHT
VERT HOLD
VERT LINEARITY
DEFLECTION YOKE
HORIZ AFC
6AL5
HORIZ MULT
6CG7
HORIZ HOLD
HORIZ DRIVE
HORIZ OUTPUT
6DQ6
DO NOT MEASURE
HV RECT
1B3GT
DAMPER
6AU4GT
DO NOT MEASURE
BOOST 580V
HV TRANSFORMER TERMINAL BOARD
SW ON VOLUME CONTROL
LV RECT
5U4GB
RED 280VAC
RED YEL
BLK
RED 280VAC
GRN
6.3VAC
DENOTES CHASSIS GROUND
To Speaker Socket
To Pin 8 Of V11 (Audio Output Cathode)
150V SOURCE
280V SOURCE
290V
1/2 Amp.
Mixer-Osc. Selector Wheel viewed From Rear
CHANNEL SELECTOR WHEEL SHOWN IN CHANNEL 13 POSITION
RF Selector Wheel (Viewed From Rear)
Mixer Osc. Selector Wheel (Viewed From Front)
VHF Tuner Part #NE 142-7
Note: Numbers & Letters Have Been Assigned For Circuit Tracing Ease But Do Not Actually Exist
Selenium 3 Lug Diode Circuit - Part #B365-2 Used In Lieu Of V18-6AL5 Horiz AFC In Some Versions
Connections For Optional Speaker Used In Some Models With 21LAP5B Chassis
Twin Speaker Connections Used In Some Versions
Alternate Speaker Connections Used In Some Versions
Connect Focus Jumper From Pin 6 To Pins 2 Or 10 For Best Focus
AMPLITUDE VARIES WITH SETTING OF NOISE GATE CONTROL R1
ADMIRAL
MODEL T323B1B (Ch. 20Z4EFB, FFB, PSB)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

TUBE PLACEMENT CHART

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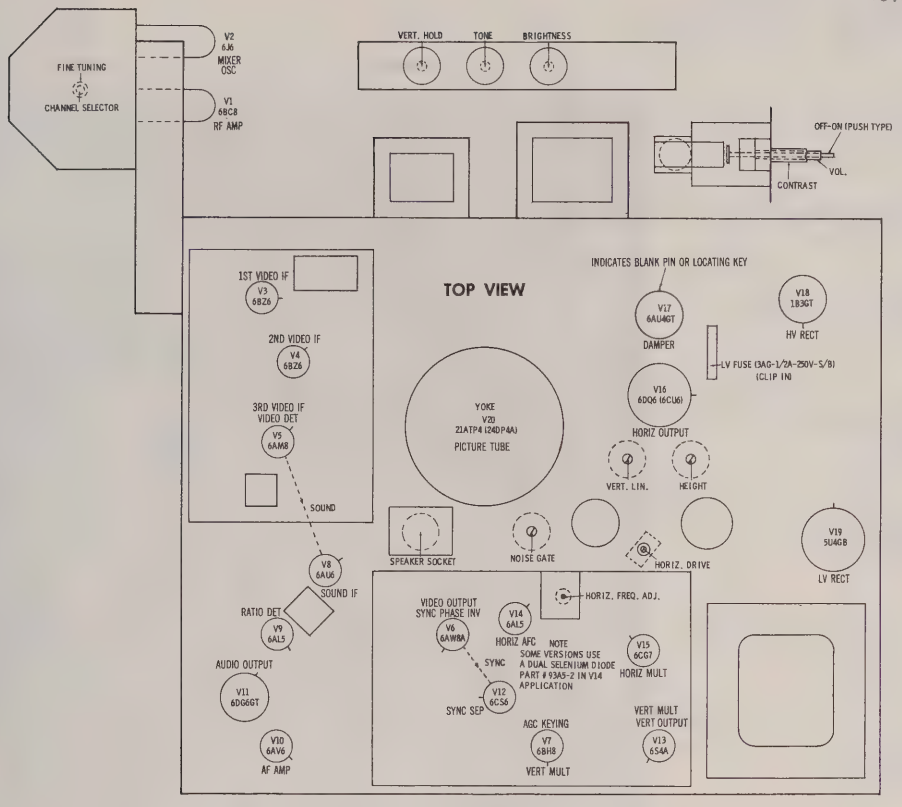

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M1), V19**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5**
No pic, no sound, has snow - **V1, V2, V3, V11**
No pic, has sound, has raster - **V6, V20, V11**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V7, V11**

SYNC FAILURE
No vert. sync - **V12, V6, V11**
No horiz. sync - **V12, V6, V14, V11**
No vert. or horiz. sync - **V12, V6, V11**

SWEEP FAILURE
No raster, has sound - **V14, V15, V16, V17, V18, V20**
No vertical deflection - **V7, V13**
Poor vert. linearity or foldover - **V7, V13**
Poor horiz. linearity or foldover - **V15, V16, V17**
Narrow picture - **V15, V16, V17, V20**
Vert. off freq. - **V7, V13**
Horiz. off freq. - **V15**

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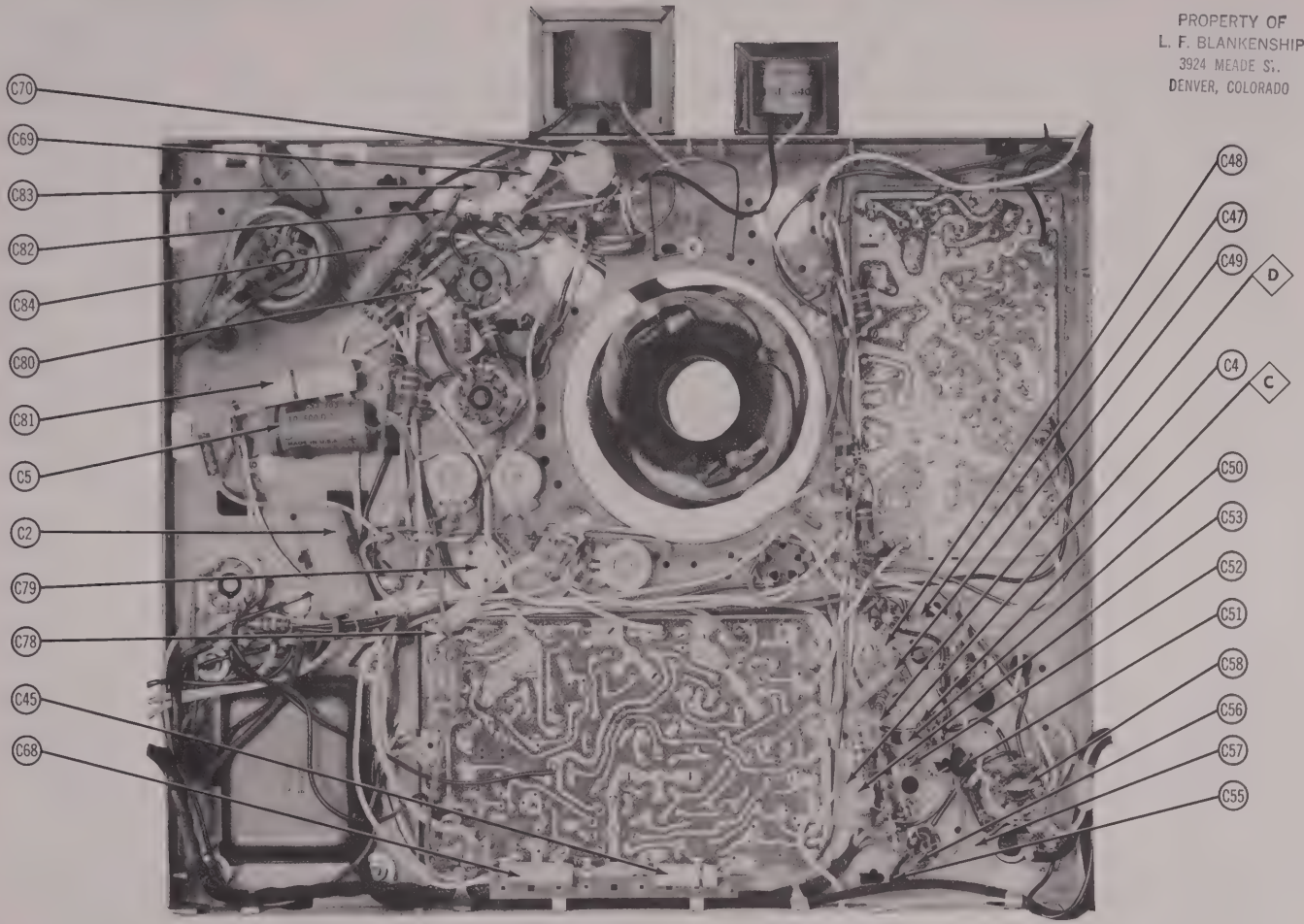


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Remove the mixer-oscillator tube (V2) and replace with a 6J6 having pin 1 removed.
Disconnect the antenna leads and connect a short jumper across the antenna terminals of the receiver.
Set the contrast control fully clockwise.
Connect the negative lead of 3 volt bias supply to point Ⓐ. Positive to chassis.
For steps 1 and 2 use a strong signal, but for all other steps use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy mixer-osc. tube. Low side to chassis.	21.25MC (Unmod)	Any non-interfering channel	DC probe thru decoupling network (Fig. 1) to point Ⓑ. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	27.25MC	"	"	A2	"
3.	"	"	22.6MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	26.5MC	"	"	A4	"
5.	"	"	25.3MC	"	"	A5	"
6.	"	"	22.3MC	"	"	A6	"
7.	"	"	23.75MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23MC (10MC Swp)	21.25MC 22.0MC 23.0MC 25.0MC 25.75MC 27.25MC	Any non-interfering channel	Vert. Amp. thru decoupling network (Fig. 1) to point Ⓑ. Low side to chassis.		Check for response similar to Fig. 2. If necessary, retouch A1 thru A7 to obtain desired response. Adjust A4 and A5 for position of 25.75MC marker and amplitude of response curve on high frequency side. Adjust A3 and A6 for position of 23.0MC marker and amplitude of response curve on low frequency side.

SOUND IF ALIGNMENT

Set the contrast control fully counter clockwise.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 8 (plate) of 6AM8 (V5). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust A11 for MINIMUM 4.5MC beat interference in the picture.

OSCILLATOR ALIGNMENT

Set the channel selector to the lowest channel operating in the area.
Set the fine tuning to the center of its range. Set other controls for a normal picture and sound. Using an 1/8" blade, non-metallic tool, adjust the oscillator slug for best picture and sound. Repeat this procedure for remaining channels operating in the area adjusting from the lowest to the highest channel. NOTE: If two slugs are visible adjust the upper slug.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

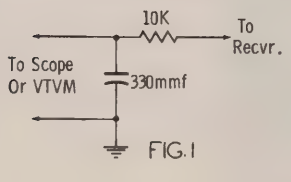


FIG. 1

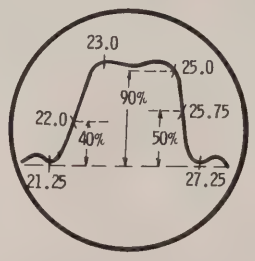


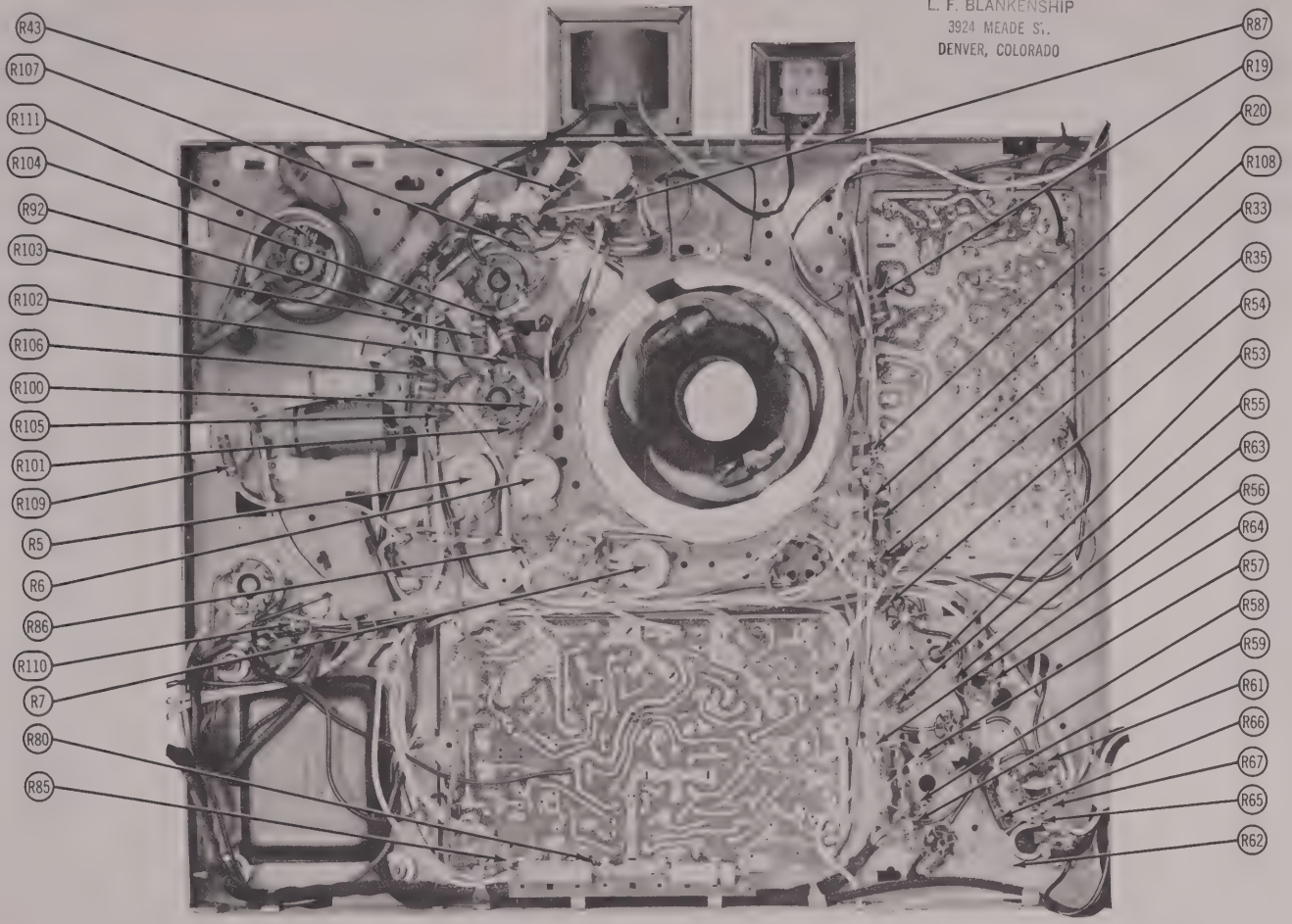
FIG. 2

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible]
DENVER, COLORADO

CHASSIS TOP VIEW

ADMIRAL MODEL T323B1B
(Ch. 20Z4EFB, FFB, PSB)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

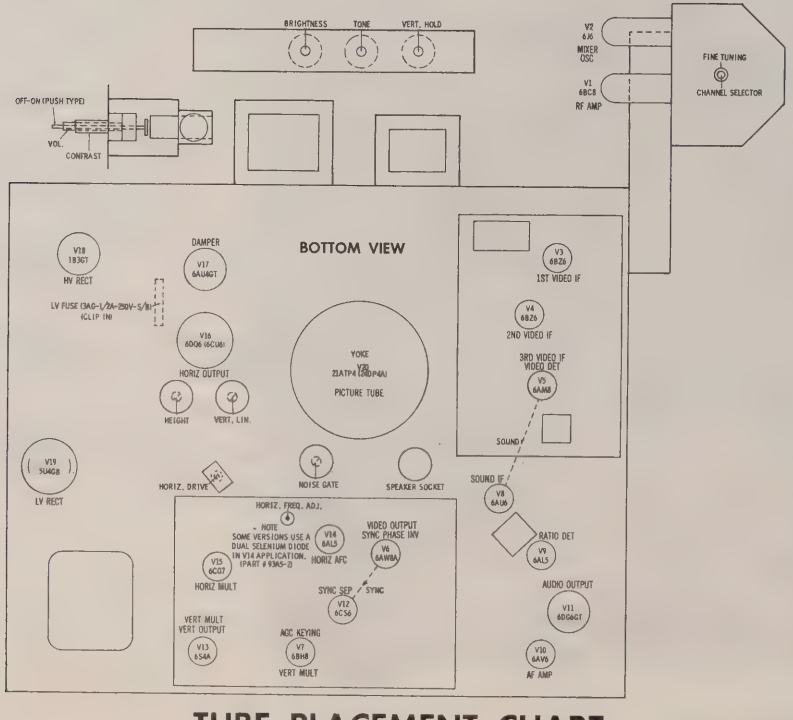


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC8	†3300Ω	320K	INF	.1Ω	0Ω	INF	3.5Meg	0Ω	0Ω
V2	6J6	▲ 10K	▲ 8700Ω	0Ω	.1Ω	230K	10K	0Ω		
V3	6BZ6	150K	56Ω	0Ω	.1Ω	■ 1000Ω	■ 1000Ω	0Ω		
V4	6BZ6	■ 27K	■ 47Ω	.1Ω	0Ω	†100Ω	†100Ω	†130K		
V5	6AM8	120Ω	.3Ω	†18K	0Ω	.1Ω	†11K	.2Ω	4700Ω	0Ω
V6	6AW8	3300Ω	1.5Meg	†10K	0Ω	.1Ω	● 10Ω	4600Ω	▲ 8400Ω	▲ 4600Ω
V7	6BH8	● 330K	220K	●‡3.2Meg	.1Ω	0Ω	▲ 220Ω	▲ 10K	†0Ω	1.8Meg
V8	6AU6	470K	0Ω	0Ω	.1Ω	▲ 1000Ω	▲ 1000Ω	120Ω		
V9	6AL5	INF	INF	0Ω	.1Ω	10K	0Ω	10K		
V10	6AV6	4.7Meg	470Ω	0Ω	.1Ω	0Ω	0Ω	†370K		
V11	6DG6GT	TP	.1Ω	†470Ω	†220Ω	420K	TP	0Ω	¶	
V12	6CS6	● 45K	0Ω	.1Ω	0Ω	▲ 45K	▲ 18K	1.8Meg		
V13	6S4A	NC	●900Ω	1.5Meg	0Ω	.1Ω	1.5Meg	NC	NC	‡10K
V14	6AL5	15Ω	15Ω	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V15	6CG7	†5600Ω	5.2Meg	1500Ω	0Ω	.1Ω	†82K	150K	1500Ω	0Ω
V16	6DQ6	NC	.1Ω	TP	†8000Ω	470K	TP	0Ω	0Ω	TOP CAP †16Ω
V17	6AU4GT	NC	NC	¶	NC	†0Ω	NC	.1Ω	0Ω	
V18	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡485Ω
V19	5U4GB	NC	¶	NC	20Ω	NC	21Ω	NC	¶	
V20	21ATP4	.1Ω	56K	PIN 6 ‡9000Ω	PIN 10 ‡9000Ω	PIN 11 ● 200K	PIN 12 0Ω			

■ MEASURED FROM PIN 7 OF V4.
▲ MEASURED FROM 150V SOURCE.
† MEASURED FROM 280V SOURCE.
‡ MEASURED FROM PIN 3 OF V17.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SWEEP AND SYNC PRINTED BOARD

ADMIRAL MODEL T323B1B
(Ch. 20Z4EFB, FFB, PSB)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BC8	
V3	Mixer-Oscillator	6J6	
V5	1st Video IF Amp	6JC6	
V4	2nd Video IF Amp	6BZ6	
V5	3rd Video IF Amp - Video Amp	6AM8	
V6	Video Output-Sync Phase Inverter	6AW8A	
V7	AGC keying-Vert. Mult.	6BH8	
V8	Sound IF Amp	6AL6	
V9	Ratio Det.	6AL5	
V10	AF Amplifier	6AV6	
V11	Audio Output	6DK6GT	
V12	Sync Separator	6JB6	
V13	Vert. Mult.-Vert. Output	6S4A	
V14	Horiz. AFC	6AL5	Note 1
V15	Horiz. Mult.	6CQT	
V16	Horiz. Output	6DQ6	Note 2
V17	Damper	6AU4GT	
V18	HV Rectifier	1B3GT	
V19	LV Rectifier	5U4GB	

Note 1. In chassis stamped Run 13 a dual selenium diode (part #93AB-3) is used in this application.
Note 2. Some versions may use a 6CU6 in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	ADMIRAL Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	
V20	21ATP4	21ATP4, 21ATP4A ①	21ATP4, 21ATP4A ①, 21DP4A ①, 24DP4A ①, 24VP4 ①	① Aluminized ② Silver screen "65"
	24DP4A	24DP4A/ 24VP4 ①	24DP4A ①, 24VP4 ①	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA ADMIRAL Part No.	AEROVOX Part No.	CORNELL DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1A	60	350	67ME5-105	AFH3-114-60	CD67S	FP385	TC68	7-115	TVL-3639.3
B	400	350				TC68		MT-3520	
C	120	200							
C2	40	200	67A4-21	PRS250V40	BR4025	TC58	TC50-250	MT-2545	TVA-151
C3A	40	200	67DE5-109	AFH3-84-50	CO636	FP27-8	TC50X	T-755	TVL-3467
B	60	200						MT-4550	
C	20	50							
C4	10	50	67A4-9	PRS150V4	BBR4-50	TC30	TC40-50	MT-0604	TVA-1402
C5	10	500	67A4-34 ①	PRS500V10	BR1250	TC82	TC10-500	MT-5010	TVA-1963

① Some versions may use a 10MFD @ 475V DC (Part #67A4-32) in this application

FIXED CAPACITORS

Capacity values given in the rating column are in mfd for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C6	5.0		65D10-108	NPO-S1 5.0		C10YSC	TCO-5	ZT-555	DTCD-V5	NPO 10%
C7	6.8		65D10-26	NPO S1 6.8	TCZ-6R8	C10Y6SC	TCO-6.8	ZT-5568	STCD-V6S	NPO 10%
C8	6.8		65D10-26	NPO-S1 6.8	TCZ-6R8	C10Y6SC	TCO-6.8	ZT-5568	STCD-V6S	NPO 10%
C9	9-12		94EX40-38							
C10	1000		65B26-5	EF-001	MPT-1000			503C-DI		
C11	3.0		65B28-050	NPO-S1 3		C10Y3C	TCO-3	ZT-553		10%
C12	5-3		65A38-6		529-3		3115-D	C7595A		
C13	1000		65B26-6	EF-001	MPT-1000				503C-DI	
C14	1000		65B26-6	EF-001	MPT-1000				503C-DI	
C15	2.2		65D01-27							N750 10%
C16	1.5		65B28-068	NPO-S1 1.5	TCZ-1R5	C10Y1SC	TCO-1.5	ZT-5515	STCD-V1S	10%
C17	5-3		65A38-6		529-3		3115-D	C7595A		
C18	47		65D10-73							N1400 5%
C19	10		65D10-50	N750-S1 10	TCN-10	C10Q1U	TCT-10	NT-541	STCU-Q1	N750 5%
C20	5		65D10-32	N750-S1 5	TCN-5	C10V5U	TCT-5	ZT-555		N750 5%
C21	2.2		65D10-131	NPO-S1 2.2		C10Y2SC	TCO-2.2			NPO 10%
C22	120		65D10-80	BPD-00013		L10T12	ED-150	UC-5311	SGA-T12	
C23	1000		65B26-5	EF-001	MPT-1000				503C-DI	
C24	1000		65B26-5	EF-001	MPT-1000				503C-DI	
C25	33	200				BC2F33J			SER-F33	Note 1
C26	5000			BPD-006	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C27	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C28	5000			BPD-006	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C29	22	200	64B16-51			BC2F22J		ACE6022	SER-F22	
C30	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C31	3.3		65D6-89	NPO-S1 3.3	TCZ-3R3	C10Y3SC	TCO-3.3	ZT-5533	STCCD-V33N	PG, ± 25MMF
C32	22		65D6-113	NPO-S1 22	TCZ-22	C10Q2SC	TCO-22		STCC-Q22	NPO 10%
C33	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C34	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C35	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C36	10000			BPD-01	DD-103	BYA851	ED-01	DC511	SHK-S1	
C37	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C38	5000			BPD-006	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C39	5000			BPD-006	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C40	5.6		65B28-068	NPO-S1 5.6	TCZ-5R6	C10Y5SC	TCO-5.6	ZT-5568	STCCD-V56	10%
C41	6.8		65B28-068	NPO-S1 6.8	TCZ-6R8	C10Y6SC	TCO-6.8	ZT-5568	STCCD-V68	10%
C42	22	400	64B16-39			BC2F22J		ACE6022	SER-F22	
C43	22	200	64B16-51			BC2F22J		ACE6022	SER-F22	
C44	47	200	64B16-49			BC2F47J			SER-F47	
C45	1000			P1858N-001	DD8-103	CUB3E2		GEM-1631	MB-D1	
C46	10		65D6-44	NPO-S1 10	D6-100	C10Q1C	ED-10	ZT-541	STCC-Q1	10%
C47	50		65D6-01	NPO-S1 20	TCZ-20	C10Q2C	TCO-20	ZT-5542	STCC-Q2	5%
C48	5000			65C10-5	BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5
C49	180			65C10-53						N330 5%
C50	5000				BPD-0005	DD-501	L10T5	ED-500	UC-535	SGA-T5
C51	5000				BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5
C52	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C53	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C54	4.3	400		P4SIN-053	DF-503	CUB6S3		GEM-4233	STM-053	
C55	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C56	72			1488-000072	D6-720	2SR5G72	ED-72		MS-472	Note 3
C57	10000			BPD-01	DD-103	BYA851	ED-01	DC511	SHK-S1	
C58	10000			BPD-01	DD-103	BYA851	ED-01	DC511	SHK-S1	
C59	5000			BPD-0022	DD-522	BYA10D22	ED-0022	UC-5222	SGA-D22	
C60	22	200	64B16-51			BC2F22J		ACE6022	SER-F22	
C61	5000			BPD-005	DD-502	BYA1026	ED-005	DC525	SHK-D5	
C62	2200			1484-0025		1R5D22		MS-522		10%
C63	033	400								10%
C64	033	600	64B15-10							10%
C65	047	400	64B16-33			BC6S47J		ACE6247	47M-S47	
C66	047	600	64B16-9			BC6S47J		ACE6247	47M-S47	
C67	10000			BPD-01	DD-103	BYA851	ED-01	DC511	SHK-S1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA ADMIRAL Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
	OHMS	VOLT								
C68	.001	1600		P1858N-001	DD30-102	CUB1E01		GEM-1631	MB-D1	
C69	.0068	600		P488N-0068	DD-682	CUB5D68	GP-6800	GEM-6568	6TM-D68	
C70	10000	1400		DAC-37	DD8-103	HY1E801		GEM-1611	B1-S10	
C71	.001	600				1R5D1	ED-1000	MC3B5S	MS-31	10%
C72	.001	400				1R5D1	ED-1000	MC3B5S	MS-31	10%
C73	.0047	600	64B15-38			BC6S47J		ACE6247	6SE-D47	
C74	.015	200	64B16-55			BC3S15J			SE-S15	
C75	3900		65B31-303	1484-0039		1R5D39			MS-339	10%
C76	.100				D6-351	5SE139			MS-339	10%
C77	680			1484-00068		1R5T68			MS-368	5%
C78	.0047	600		P488N-0047	D6-472	CUB5D47	GP-4700	GEM-6347	6TM-D47	
C79	170-190		66A30-3							
C80	.047	600		P488N-047	DF-505	CUB8S47		GEM-8147	8TM-647	
C81	.1	600		P488N-1	DF-104	CUB8P1		GEM-601	8TM-P1	
C82	220	1000	95TH3-89							N1500 5%
C83	150	5000	65D10-88							N1500 5%
C84	.047	1000		P10SBN-047		CUB1G47		GEM-1047	10TM-647	
C85	.047	1000		P10SBN-047		CUB1G47		GEM-1047	10TM-647	Note 3

Note 1. Some versions use .47MFD, 200V molded upright in this application (Part #64B16-49)
Note 2. Not used in chassis stamped Run 13 or Run 14.
Note 3. Some versions use 50MMF, 500V ceramic disc in this application (Part #65D6-4).

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1000Ω	½	78B39-3					Contrast
B	1Meg							Volume - Tap ② 100K
C	Switch							
R2A	500Ω	½	78C13-65	B-68	A47-300K-8	Q31-139	U68	Vert. Hold
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
R3A	250K	½	78C13-65	B-68	A47-300K-8	Q31-143	U63	Vert. Hold - Note 1
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
R4A	300K	½	78C13-62	B-46	A47-300K-6	Q31-129	U45	Vert. Hold - Note 2
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
R5A	1Meg	½	78D12-67	B-78	A47-1Meg-Z	Q33-139	U55	Tone
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
A	2Meg	½	78C13-67	B-76	A47-2Meg-Z	Q33-139	U55	Tone - Note 1
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
A	2Meg	½	78C13-64	B-78	A47-2Meg-Z	Q33-139	U55	Tone - Note 2
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
R6A	100K	½	78D13-53	B-60	A47-100K-8	Q31-138	U61	Brightness
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
A	100K	½	78C13-53	B-60	A47-100K-6	Q31-128	U45	Brightness - Note 1
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
A	100K	½	78C13-63	B-60	A47-100K-6	Q31-138	U61	Brightness - Note 2
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
R8A	3.5Meg	½	78D30-1	BX-83	A47-3.5Meg-Z	Q31-239	BU-566	Height
B	Shaft			Not Req.	X38-3	Not Req.	Not Req.	
A	2.5Meg	½	78C20-1	BX-82	FX8-1/2-3.5Meg	RQ	Not Req.	Height - Note 3
B	Shaft			Not Req.	AK-1	Not Req.	Not Req.	
R9	3000Ω	½	78C30-7	AB-27	FX8-1/2	RQ	Not Req.	Vert. Lin.
B	Shaft			AK-1	FX8-1/2	RQ	Not Req.	
R7A	5Meg	½	78D30-88	AB-37	A47-5Meg-6	Q31-141	TA6EL	Noise Gate
B	Shaft			AK-1	FX8-1/2	RQ	Not Req.	
A	5Meg	½	78C30-38	AB-37	A47-5Meg-6	Q31-141	TA6EL	Noise Gate - Note 3
B	Shaft			AK-1	FX8-1/2	RQ	Not Req.	

Note 1 Alternate part number used when controls are mounted on side of cabinet.
Note 2. Alternate part number used when controls are mounted at front of cabinet.
Note 3. Alternate part number used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL Part No.	IRC Part No.	NOTES
R8	680K			BTS-680K	
R9	470Ω			BTS-470	
R10	820K			BTS-820K	
R11	560K			BTS-560K	
R12	33Ω			BTS-33	
R13	10K			BTS-10K	
R14	220K			BTS-220K	
R15	82K			BTS-82K	
R16	8200Ω	5%		BTS-8200Ω 5%	
R17	10K			BTS-10K	
R18	10K			BTS-10K	
R19	3300Ω	2		BTS-3300	
R20	470Ω			BTS-470	
R21	10000			BTS-10000	
R22	4700Ω	5%			
R23	10000			BTS-10000	
R24	27K				
R25	220K				
R26	220K				
R27	56Ω			BTS-56	
R28	27K				
R29	10K	5%			
R30	1000Ω			BTS-1000	
R31	47Ω			BTS-47	
R32	1000Ω			BTS-1000	
R33	10K	2			
R34	1200Ω			BTS-1200	
R35	4.7Meg			BTS-4.7Meg	
R36	180Ω			BTS-180	
R37	4700Ω				
R38	100Ω			BTS-100	
R39	47K				
R40	8200Ω				
R41	4700Ω	2			
R42	470Ω				
R43	56K				
R44	180K				
R45	390K			BTS-390K	
R46	4.7Meg			BTS-4.7Meg	
R47	4.7Meg			BTS-4.7Meg	
R48	2.2Meg			BTS-2.2Meg	
R49	150K			BTS-150K	
R50	6.2Meg			BTS-6.2Meg	
R51	680K			BTS-680K	
R52	470K			BTS-470K	
R53	1000Ω			BTS-1000	
R54	1200			BTS-1200	
R55	5600			BTS-5600	
R56	47K	1		BTS-47K	
R57	10K	5%		BTS-10K	
R58	10K			BTS-10K	
R59	4.7Meg			BTS-4.7Meg	
R60	22K			BTS-22K	
R61	3.3Meg			BTS-3.3Meg	
R62	470K			BTS-470K	
R63	470Ω			BTS-470	
R64	27K	1		BTA-27K	
R65	1000			BTS-1000	
R66	1Meg	5%		BTS-1Meg 5%	
R67	820K	5%		BTS-820K 5%	
R68	15K			BTS-15K	
R69	1.8Meg			BTS-1.8Meg	
R70	120K			BTS-120K	
R71	68K			BTS-68K	
R72	22K	2		BTS-22K	
R73	470K			BTS-470K	
R74	2.2Meg			BTS-2.2Meg	
R75	4.7Meg			BTS-4.7Meg	
R76	68000			BTS-6800	
R77	33000			BTS-3300	
R78	33000			BTS-3300	
R79	330K			BTS-330K	
R80	100K			BTS-100K	
R81	2.2Meg			BTS-2.2Meg	
R82	15K			BTS-15K	
R83	150K			BTS-150K	
R84	1.5Meg			BTS-1.5Meg	
R85	220K			BTS-220K	
R86	8200	5%		BTS-820 5%	
R87	2700Ω			BTS-2700	

RESISTORS (cont)

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL Part No.	IRC Part No.	NOTES
R88	560Ω			BTS-560	
R89	56Ω			BTS-56	
R90	100K	5%		BTS-100K	
R91	100K	5%		BTS-100K	Note 1
R92	150	1		BTS-150	Note 1
R93	470K			BTS-470K	Note 1
R94	4.7Meg			BTS-4.7Meg	Note 1
R95	5600Ω			BTS-5600	
R96	1500Ω			BTS-1500	
R97	150K			BTS-150K	
R98	82K			BTS-82K	
R99	56000Ω			BTS-56000	

Note 1. In some versions R103 and R104 are replaced with a single 8200Ω, 3W resistor.
Note 2 In some versions R105 and R106 are replaced with a single 8200Ω, 3W resistor.

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL Part No.	IRC Part No.	NOTES
R100	100Ω			BTS-100	
R101	470K				
R102	100Ω			BTS-100	
R103	18K	2		BTD-18K	Note 1
R104	15K	2		BTD-15K	Note 1
R105	18K	2		BTD-18K	Note 2
R106	18K	2		BTD-18K	Note 2
R107	2700				
R108	2200Ω			BTS-2200	
R109	2200Ω	1		BTA-220	
R110	2700K	1		BTA-270K	
R111	4.7K			BW-4.7	

TRANSFORMER (POWER)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No
T1	117VAC ① 2.8A	660VCT @ 240A	6V @ 3A	6.3V @ 10.4A	80C35-8	P8739 ① ②	P-3058 ①	P-8167 ② ③	20R90 ②	R-55DC

① Tape 15.6V filament winding.
② Drill new mounting holes
③ Parallel and phase 6.3V filament windings

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No	NOTES
T2	Vert. Output	78B43-4	Z1807 ① ②	A-3934 ① ②	V31	A-8141	26R54	A-119X	
T3A	Yoke-Horiz (58.5MH)	94B81-13 ②	DF807	MFD-92	$ $	$ $	Y-16	Y-42 &	
B	Horiz. Output (90° Vert. 70MH) Alt. Yoke	98D67-13 ①	$ $	$ $	$ $	$ $	$ $	NY42 ①	
M4	Rear Cover and Centering Device	94B121-1							
	Yoke Clamp	19A113-3							
T4	Horiz. Output	78D61-2	FB-420 *	HVO-54 *	X129 *	A-8255 *	FLY-76 *	D-49 *	

① Drill new mounting hole(s)
② Cut and tape yellow lead.
③ Use miniature R88 and R89.
④ Use original horizontal damping network
⑤ Use original rear cover and centering device; Loosen and rotate core clamp 180 degrees, then connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5	5	5	5
6	3	4	4	4	4	4	7
7	See Note ①	3	2	3	3	3	4
8	1	1	1	1	1	1	2
Special Note:	①	②	③	④	⑤	⑥	⑦

⑥ Replace AOC coupling capacitor (C84) with approximately 25 to 50MMF @ 4KV.
⑦ Requires 2 turns for filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T5	2500Ω	6-8Ω tap @ 3-4Ω	78B75-1 ② 78B66-2 ② 78B68-2 ③	Z1104 ② Z1001	A-2928	A-2876	22S65 22S46	S-1X	1 Used with speaker #78C18-2 2 Used with speaker #78D19-2 3 Used with speaker #78D18-1 4 Use metal case mounting hole

SPEAKER

ITEM No	TYPE SIZE	TYPE FIELD	V. C. IMP.	REPLACEMENT DATA ADMIRAL Part No.	QUAM Part No.	NOTES
SP1	6"	PM	3-4Ω	78C16-2 ①	6AL	① Includes plug (Part #98B3-7) and T5
	8"	PM		78D19-2 ① ②		② Alternate part number.
	8"	PM		78D18-1 ①		
	8"	PM		78D25-2 ②		

COILS (RF-IF)

ITEM No	USE	ADMIRAL Part No.	NOTES
L1	RF Choke	72A2-1	
L2	Osc. Coil	72D80-15	Channel 4
L3	Osc. Coil	72D80-14	Channel 6
L4	Osc. Coil	72D80-6	Channel 8
L4	Osc. Coil	72D80-9	Channel 11

ITEM No	USE	ADMIRAL Part No	NOTES
L6	Osc. Coil	72D80-1	Channel 13
L7	RF Choke	72D80-18	
L8	Mixer Plate Coil	72A184	

ITEM No	USE	REPLACEMENT DATA ADMIRAL Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L9	27.25MC Trap	72C252-5				
L10	1st. Video IF	72C252-6				
L11	2nd. Video IF	72C252-4				
L12	21.25MC Trap	72C252-3				
L13	3rd. Video IF	72C252-2				
L14	4th. Video IF	72C252-1				
L15	RF Choke	72D26-4	19-3039	TV-180	6251 ① 6176	① Includes cap. 36 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L16	Series Peaking Coil	73B5-26	19-3180 *	TV-184 *	6180 *	188 Microhenries, wound on 4700Ω resistor
L17	Shunt Peaking Coil	73B5-20	19-3500	TV-203	6174	500 Microhenries
L18	4.5MC Trap	72C132-1				
L19	Series Peaking Coil	73B5-14	19-3250 ▲	TV-185 ▲	6181 ▲	254 Microhenries, wound on 18K resistor
L20	Shunt Peaking Coil	73A11-1		TV-207 ♦	6156 ♦	790 Microhenries, wound on 10K resistor
L21	Sound IF	72C132-1				
L22	Ratio Det.	72C68-2	17-1033	TV-110	1468	

▬ Connect .005MFD cap. from R32 to ground.
* Parallel 4700Ω resistor.
▲ Parallel 18K resistor.
♦ Parallel 10K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L23	40Ω		94C17-4		TV-164					22-46 Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L24	.240A	55Ω	1.3 HY.	74B18-13	C5037①	C-2996 ①	C-2326 ①	26C41	C-24X	

① Drill one new mounting hole.

COMPONENT COMBINATIONS

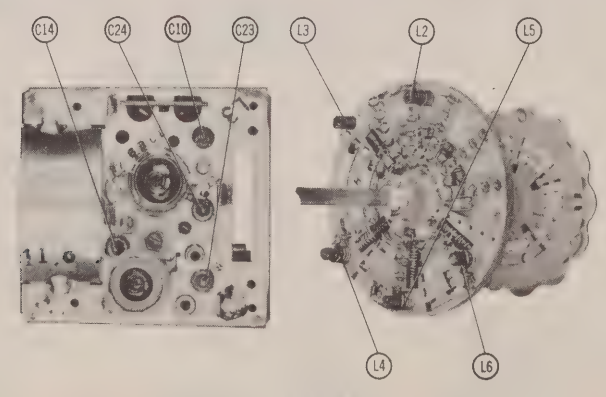
ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA	
K1	Sync Couplate	150MMF, 10000MMF, 270K	63C9-3	Aerovox Centralab Sprague	PA-459 PC-184 101C-11A2
K2	Vert. Inegrator	2000MMF, 5000MMF, 5000MMF, 22K, 8200Ω, 8200Ω	63C9-7	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-104 115TM1 1405-01 V-1

FUSES

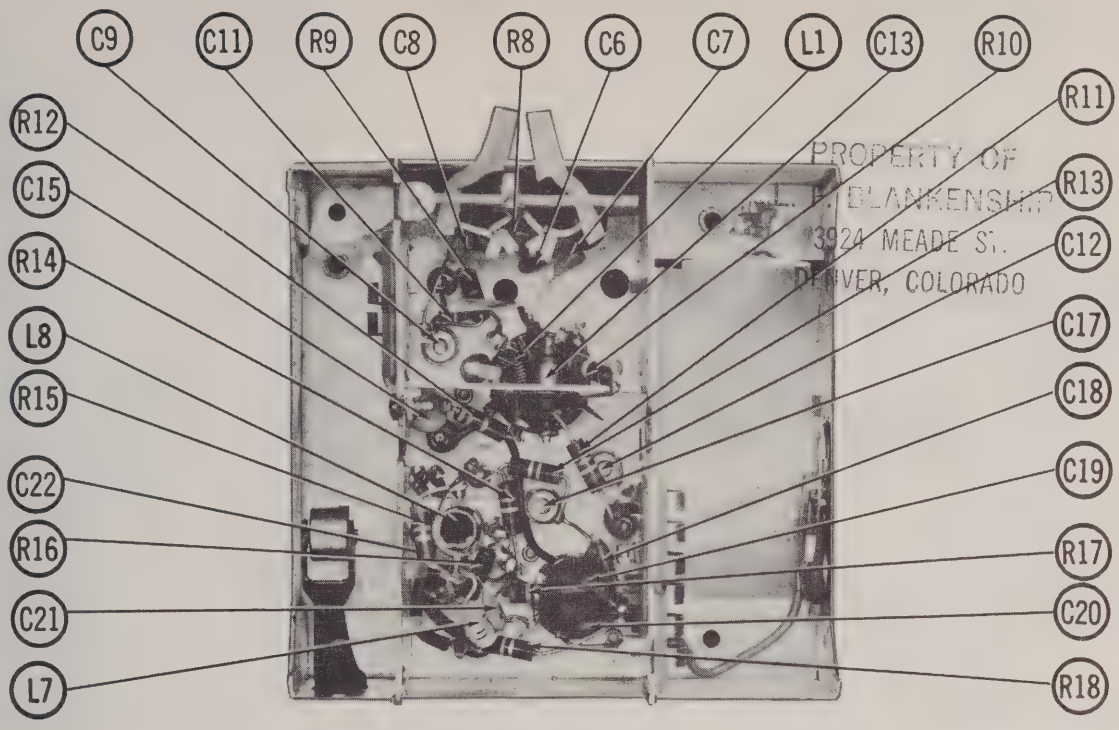
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1/2A 250V S/B	84A1-33	84A5-4	313.500 (3AG 1/2A 125V S/B)	357001	MDL 1/2	4405

MISCELLANEOUS

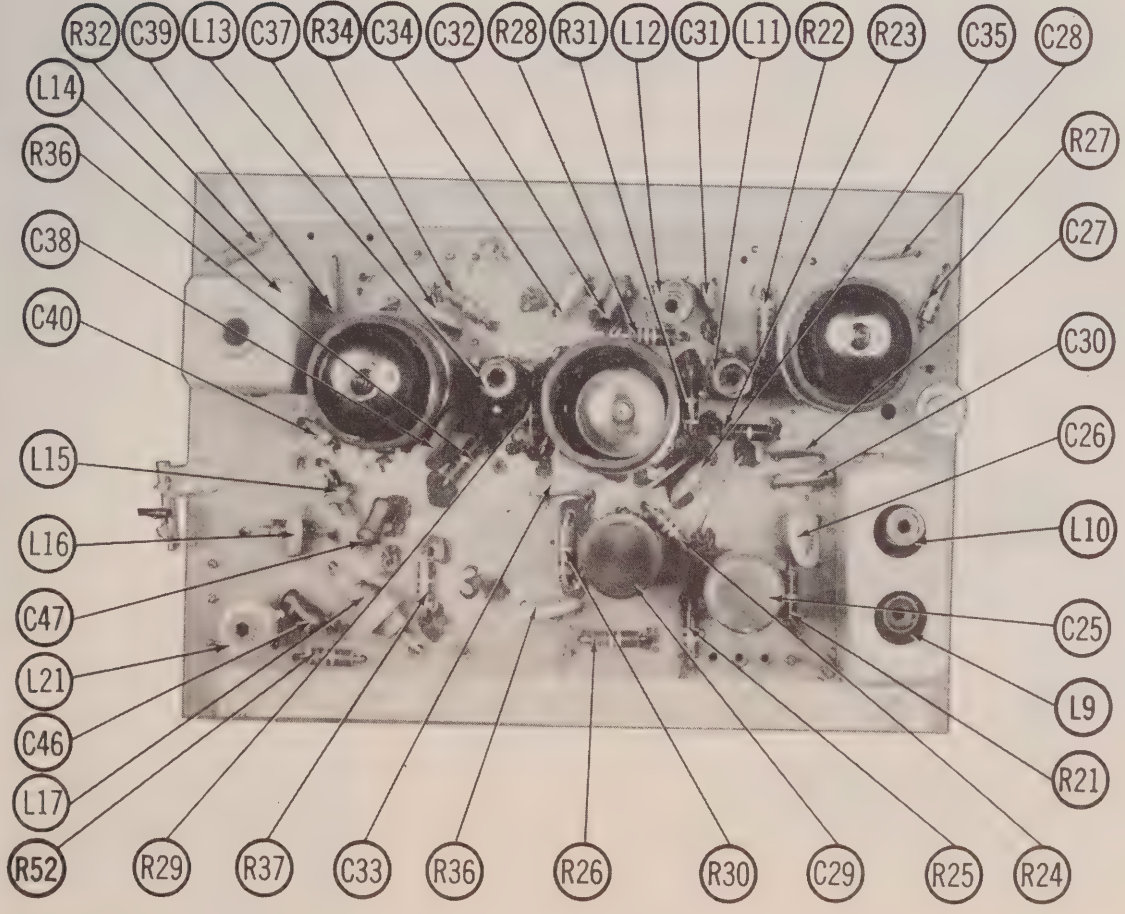
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M2	Pilot Light		Type #51
M3	Tuner	94E142-2	VHF
M4	Centering Device	94B121-1	Include yoke cover
M5	Ion Trap	94A15-4	
	Printed Board	A4861-3	Video IF
	Printed Board	A5298	Sync and sweep



RF TUNER

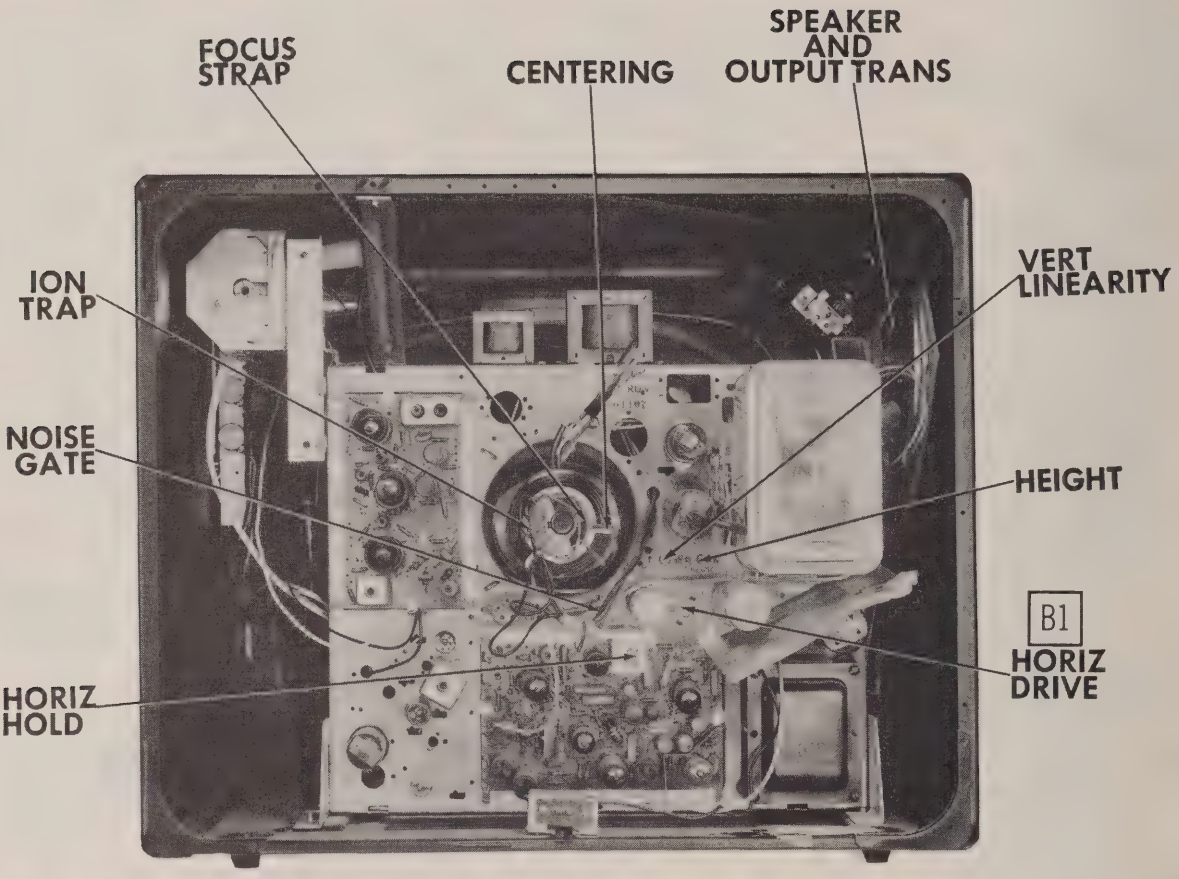


RF TUNER BOTTOM VIEW



VIDEO IF PRINTED BOARD

FOLDER 2



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive trimmer (B1) until white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

PHOTOFACT* Folder

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HOFFMAN MODELS B3234, U, B3261, U, B3271, U, B3304, U, M3234, U, M3261, U, M3271, U, M3304, U, P3234, U, P3261, U, P3271, U, P3304, U (Ch. 331, U)

MODEL M3234 (Ch. 331)

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FOLDER 3

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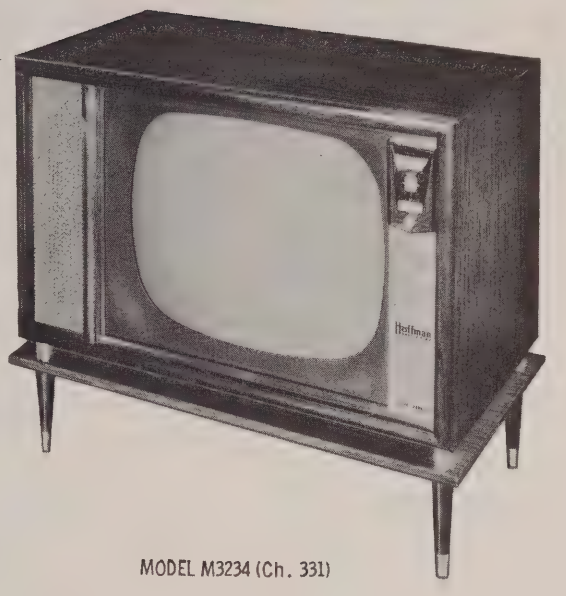

MODEL M3234 (Ch. 331)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from the front.
2. Remove 7 wood screws and the rear cover.
3. Remove the picture tube socket, yoke plug, HV lead, 2 speaker leads and 4 leads from power tuning selector buttons.
4. Remove 1 wood screw from the top chassis brace.
5. Lay receiver face down on a pad and remove 4 screw in legs and bottom shelf.
6. Remove 2 chassis bolts.
7. Remove the chassis.

TRADE NAME	Hoffman	MODELS	CHASSIS
		B3234, B3261, B3271, B3304, M3234, M3261, M3271, M3304, P3234, P3261, P3271, P3304	331
		B3234U, B3261U, B3271U, B3304U, M3234U, M3261U, M3271U, M3304U, P3234U, P3261U, P3271U, P3304U	331U
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 200 Watts, 1.7 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws and the trim along the top of the safety glass. Tilt glass out and lift up to remove.

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A3) located on top of chassis.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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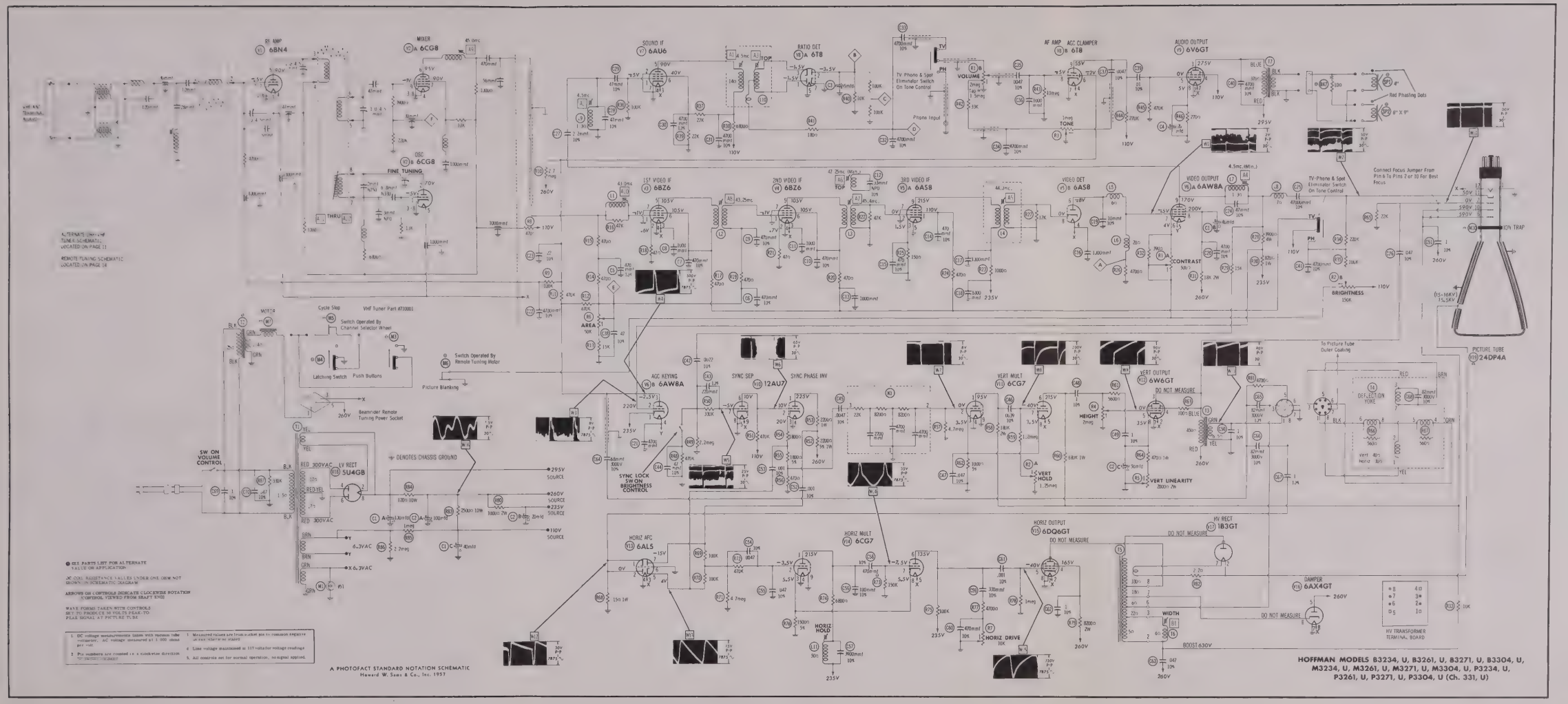

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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TUBE PLACEMENT CHART

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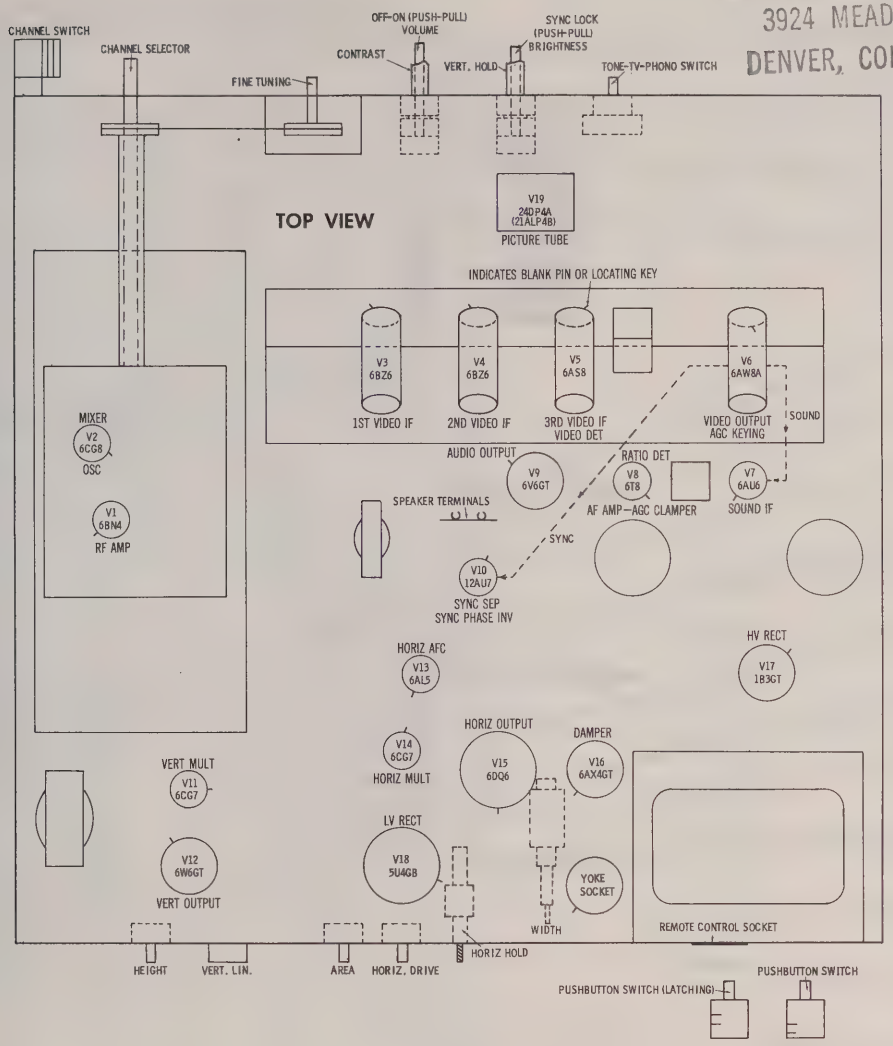

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V18**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V19**
Has pic, no sound - **V7, V8, V9**
Overloaded picture - **V6, V8**

SYNC FAILURE
No vert. sync - **V10**
No horiz. sync - **V10, V13**
No vert. or horiz. sync - **V10**

SWEEP FAILURE
No raster, has sound - **V13, V14, V15, V16, V17, V18**
No vertical deflection - **V11, V12**
Poor vert. linearity or foldover - **V11, V12**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V18**
Vert. off freq. - **V11**
Horiz. off freq. - **V14**

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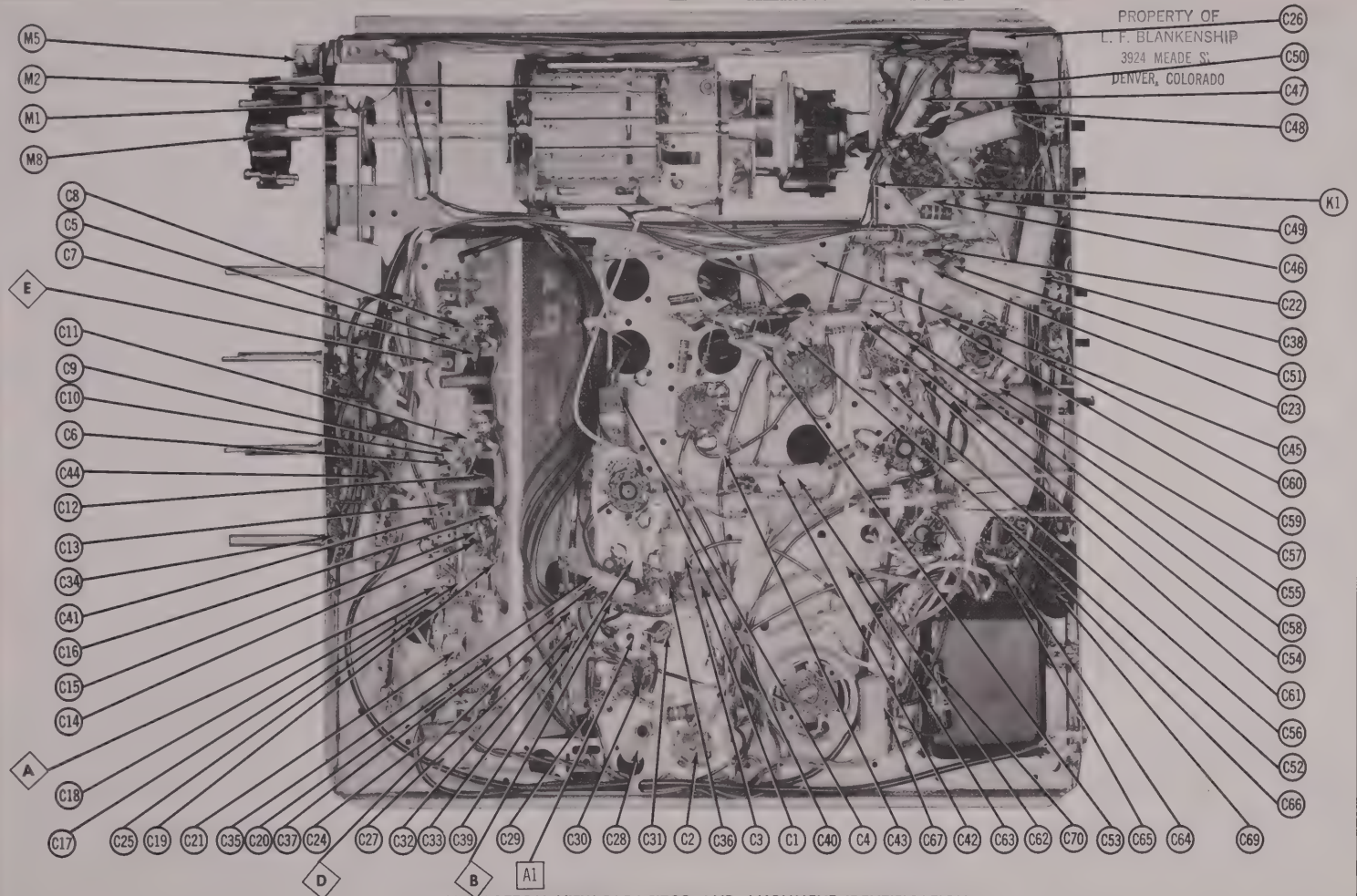

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Connect the negative lead of a 60 volt bias supply to pin 5 (grid) of the 6DQ6 (V15). Positive to chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Keep all signals below a level which would cause overloading.
The high voltage lead should be securely taped and kept away from the chassis.
Connect a 1000MMF capacitor across the terminals of the VTVM and scope.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.
Set the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.005MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point Ⓑ. Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	"	"	DC probe thru 10K to point Ⓒ. Common to point Ⓓ.	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector probe (Fig. 1) to pin 11 (cathode) of picture tube. Common to chassis.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Connect the negative lead of 3 volt bias supply to point Ⓔ. Positive to chassis.
Set the contrast control fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.005MFD	High side to point Ⓕ. Low side to chassis.	Not used	44.0MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe thru 10K to point Ⓐ. Common to chassis.	A5	Adjust for maximum deflection.
5.	"	"	"	47.25MC	"	"	A6	Adjust for MINIMUM deflection.
6.	"	"	"	45.4MC	"	"	A7	Adjust for maximum deflection.
7.	"	"	"	43.25MC	"	"	A8	"
8.	"	"	"	43.0MC	"	"	A9	Adjust for MINIMUM deflection.
9.	"	"	"	43.0MC	"	"	A10	Adjust for maximum deflection.
10.	"	"	"	45.0MC	"	"	A9	"
11.	"	"	44.0MC (10MC Swp)	45.0MC 45.75MC	"	Vert. Amp. thru 10K to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 2. If necessary, retouch A4, A6 and A7 SLIGHTLY for desired response.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓐ. Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A12	
			201MC	199.25MC 203.75MC	11		A13	
			195MC	193.25MC 197.75MC	10		A14	
			189MC	187.25MC 191.75MC	9		A15	
			183MC	181.25MC 185.75MC	8		A16	
			177MC	175.25MC 179.75MC	7		A17	
			85MC	83.25MC 87.75MC	6		A18	
			79MC	77.25MC 81.75MC	5		A19	
			69MC	67.25MC 71.75MC	4		A20	
			63MC	61.25MC 65.75MC	3		A21	
			57MC	55.25MC 59.75MC	2		A22	

ALIGNMENT INSTRUCTIONS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3594 MEADE ST.
DENVER, COLORADO

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

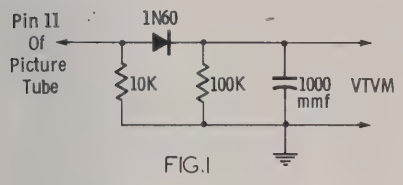


FIG. 1

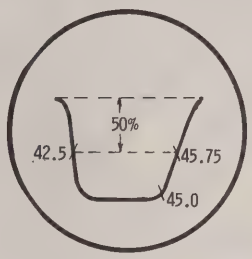


FIG. 2

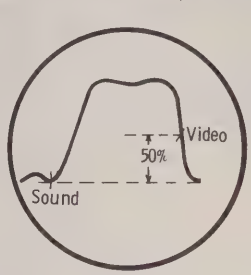
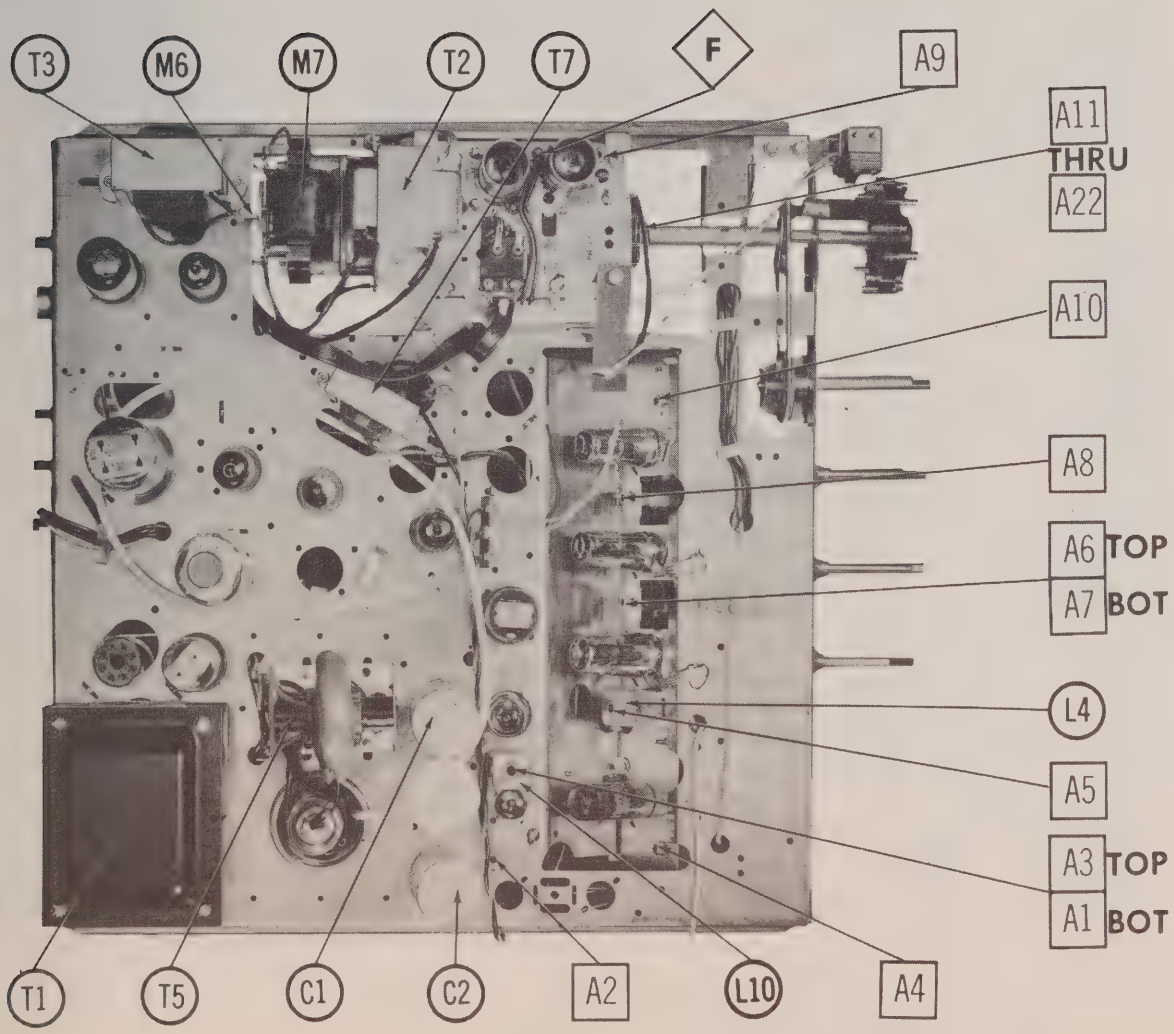


FIG. 3

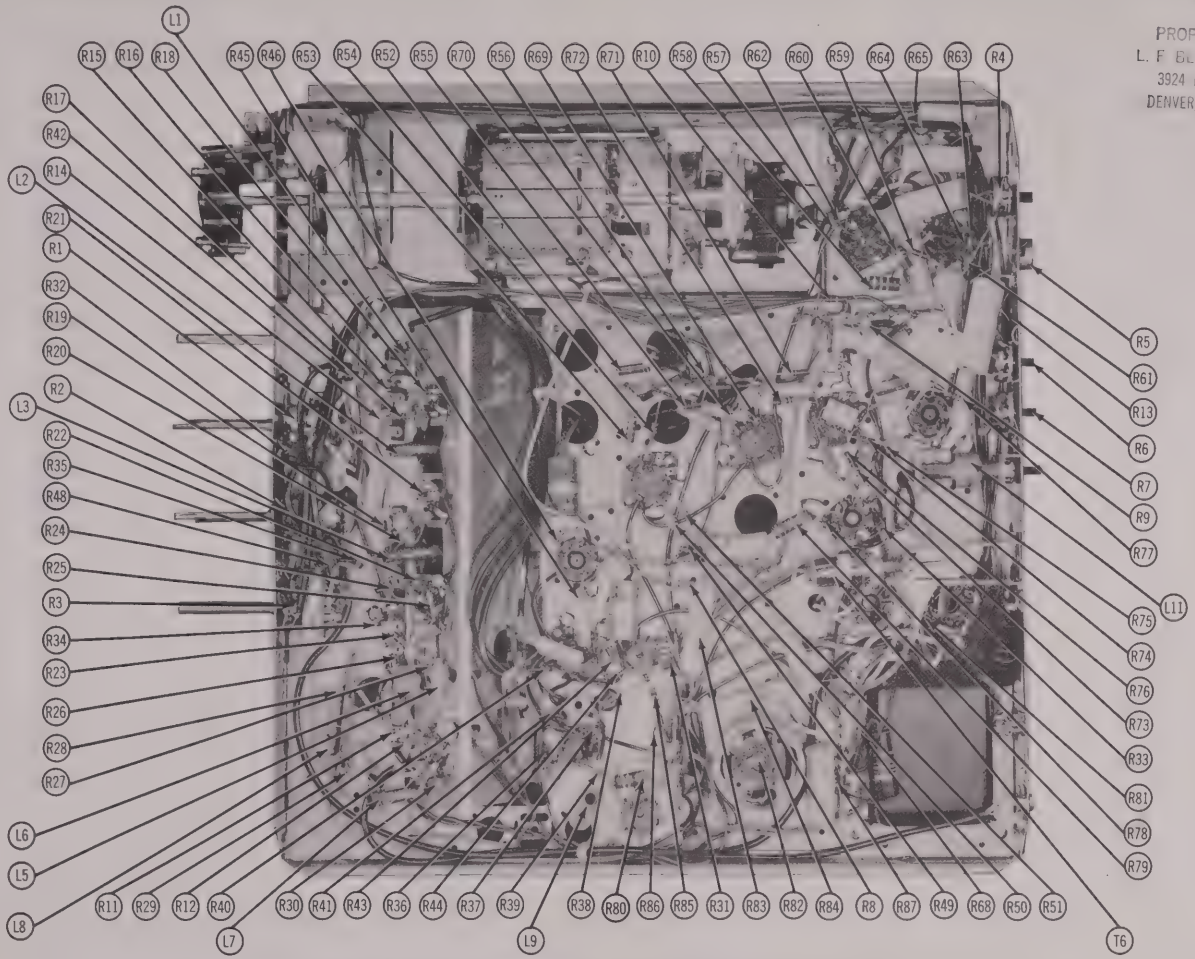


CHASSIS TOP VIEW

HOFFMAN MODELS B3234, U, B3261, U, B3271, U, B3304, U, M3234, U, M3261, U, M3271, U, M3304, U, P3234, U, P3261, U, P3271, U, P3304, U (Ch. 331, U)

FOLDER 3

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BN4	0Ω	750K	0Ω	.1Ω	†3600Ω	0Ω	750K		
V2	6CG8	10K	†9400Ω	0Ω	0Ω	.1Ω	†3600Ω	†12K	0Ω	220K
V3	6BZ6	• 60K	47Ω	.1Ω	0Ω	†3100Ω	†3100Ω	0Ω		
V4	6BZ6	• 60K	47Ω	.1Ω	0Ω	†3100Ω	†3100Ω	0Ω		
V5	6AS8	†3100Ω	.1Ω	150Ω	.1Ω	0Ω	4700Ω	0Ω	.1Ω	†2100Ω
V6	6AW8A	†1100Ω	†1900Ω	• 420K	630K	630K	• 220Ω	4700Ω	†18K	†5800Ω
V7	6AU6	100K	0Ω	.1Ω	0Ω	†9400Ω	†31K	0Ω		
V8	6T8	INF	10K	INF	.1Ω	0Ω	650K	0Ω	10Meg	†270K
V9	6V6GT	NC	0Ω	†370Ω	†2600Ω	470K	NC	.1Ω	270Ω	
V10	12AU7	†4500Ω	†470K	4100Ω	0Ω	0Ω	†470K	2.5Meg	0Ω	.1Ω
V11	6CG7	‡190K	4.7Meg	1000Ω	0Ω	.1Ω	†690K	• 1.5Meg	1000Ω	0Ω
V12	6W6GT	TP	.1Ω	†570Ω	†670Ω	• 1.5Meg	TP	0Ω	• 1300Ω	
V13	6AL5	15Ω	15Ω	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V14	6CG7	†7900Ω	5.2Meg	1500Ω	0Ω	.1Ω	†100K	150K	1500Ω	0Ω
V15	6DQ6GT	TP	.1Ω	NC	†8300Ω	1Meg	TP	0Ω	0Ω	TOP CAP ‡18Ω
V16	6AX4GT	NC	TP	¶	TP	†120Ω	TP	0Ω	.1Ω	
V17	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡348Ω
V18	5U4GB	NC	¶	NC	17Ω	TP	19Ω	NC	¶	
V19	24DP4A	0Ω	22K	PIN 6 ‡10K	PIN 10 ‡10K	PIN 11 • 340K	PIN 12 .1Ω			

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

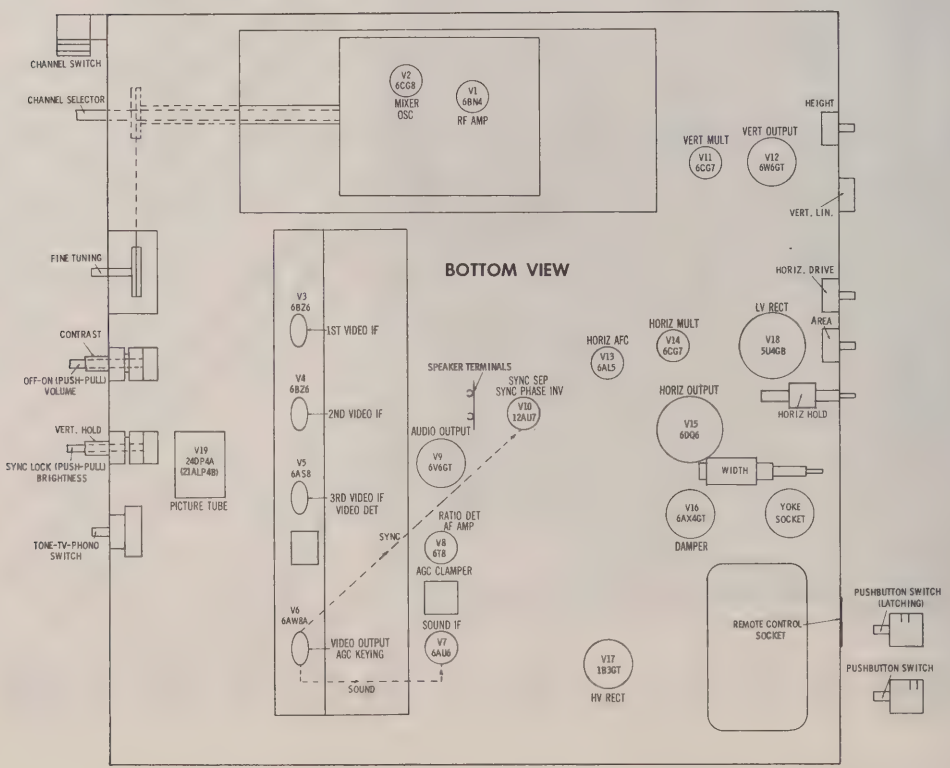
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM PIN 8 OF V18.

‡ MEASURED FROM PIN 3 OF V16.

NC NO CONNECTION.

TP TIE POINT



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO

HOFFMAN MODELS B3234, U, B3261, U, B3271, U, B3304, U, M3234, U, M3261, U, M3271, U, M3304, U, P3234, U, P3261, U, P3271, U, P3304, U (Ch. 331, U)

ALTERNATE TUNER SCHEMATIC

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE S.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	H.F Amplifier	6BN4	
V2	Mixer - Oscillator	6C8G	
V3	1st. Video IF Amp	6BZ6	
V4	2nd. Video IF Amp	6BZ6	
V5	3rd. Video IF Amp - Video Det.	6AS8	
V6	Video Output AGC Keying	6AW8A	
V7	Sound IF Amp	6AU6	
V8	Ratio Det. AF Amp - AGC Clamper	6T8	
V9	Audio Output	6V6GT	
V10	Sync Sep - Sync Phase Inv	12AU7	
V11	Vert. Mult	6CG7	
V12	Vert. Output	6W6GT	
V13	Horiz. AFC	6AL5	
V14	Horiz. Mult	6CG7	
V15	Horiz. Output	6HQ6GT	
V16	Damper	6AX4GT	
V17	H.V Rectifier	1B3GT	
V18	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	HOFFMAN PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V19	24CP4A 24VP4 1 2ALP4B	24CP4A 24VP4 1 2ALP4B 2ALP4A 1	24CP4A 24VP4 1 2ALP4B 2ALP4A 1	1 Aluminized 2 Silver screen "SS"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP	VOLT	HOFFMAN PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	.100	250	856004	AFH4-58-5A	BD483 BR4025	FP375.5 TC95	Q-352.5		R3413 *
B	.05	250							
C	.150	250							
C2A	.100	250	856903	AFH4-58-5A	FP256 TC39		T-110 MT-0550		R3403 *
B	.05	250							
C	.150	50							
C3	5	50	856006	PR5S0Y5	BBR5-50	TC30	TD-5-50	MT-1504	TVA-1303
C4	20	50	856005	PR50Y20	BBR20-150	TC45	TD-20-50	MT-1520	TVA-1306

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							
	CAP	VOLT	HOFFMAN PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C5	470		851122		DD-471	L10T47	ED-470			10%
C6	470		851122		DD-471	L10T47	ED-470			10%
C7	470		851122		DD-471	L10T47	ED-470			10%
C8	1000		850206	BPD-001	DD-102	BYAE01	ED-1000	DC521	5HK-01	
C9	470		851122		DD-471	L10T47	ED-470			10%
C10	470		851122		DD-471	L10T47	ED-470			10%
C11	1000		850206	BPD-001	DD-102	BYAE01	ED-1000	DC521	5HK-01	
C12	7-70			NPO-S1 33	TCZ-33	CD02ZC	TCO-33	ZT-5433	STCC-Q33	NPO 10%
C13	1500		850208	BPD-001	DD-152	BYAE01	ED-1000	DC521	5HK-01	
C14	470		851122		DD-471	L10T47	ED-470			10%
C15	470		851122		DD-471	L10T47	ED-470			10%
C16	1000		850206	BPD-001	DD-102	BYAE01	ED-1000	DC521	5HK-01	
C17	1000		850206	BPD-001	DD-102	BYAE01	ED-1000	DC521	5HK-01	
C18	.000		850206	BPD-001	DD-102	BYAE01	ED-1000	DC521	5HK-01	
C19	10		854042	NPO-S1 10	DD-100	L10Q	ED-10	ZT-541	STCC-Q1	10%
C20	4700		856359					GEM-2022		10%
C21	4700									10%
C22	4700		856359	BPD-0047	DD-472	BYAE0047	ED-0047	UC-5247	5GA-D47	
C23	.22	200	856179					GEM-2022		10%
C24	.47		854051	NPO-S1 47	DD-470	L10Q47	ED-47	ZT-5447	STCC-Q47	10%
C25	47000		856351							10%
C26	.047	200	856171							10%
C27	3.3		854035	NPO-S1 3.3	TCZ-3R3	C20Y3RC	TCO-3.3		STCCB-V33	10%
C28	47		854051	NPO-S1 47	DD-470	L10Q47	ED-47	ZT-5447	STCC-Q47	10%
C29	47		854051	NPO-S1 47	DD-470	L10Q47	ED-47	ZT-5447	STCC-Q47	10%
C30	4700		856359							10%
C31	4700		856359							10%
C32	4700		856359							10%
C33	4700		856359							10%
C34	4700		856359							10%
C35	.0047	200	856159							10%
C36	1000		850206	BPD-001	DD-102	BYAE01	ED-1000	DC521	5HK-01	
C37	.0047	200	856159							10%
C38	.47	200	856183					GEM-5047		10%
C39	.01	200	856163							10%
C40	4700		856359							10%
C41	4700		856359							10%
C42	.0022	400	856253							10%
C43	220		854029		DD-221	L10T22	ED-220			10%
C44	47		854051	NPO-S1 47	DD-470	L10Q47	ED-47	ZT-5447	STCC-Q47	10%
C45	.0047	200	856159							10%
C46	.0039	400	856255							10%
C47	.047	200	856171							10%
C48	.1	600	856375					GEM-601		10%
C49	.1	600	856375					GEM-601		10%
C50	.1	600	856375					GEM-601		10%
C51	.1	600	856375					GEM-601		10%
C52	.002	200	856161							10%
C53	.001	200	856151							10%
C54	.0047	200	856159							10%
C55	.047	200	856171							10%
C56	100		854065	1689-0001			22S5T1		MS-31	10%
C57	5000		856358	1684-0039			1T5D39		MS-259	10%
C58	470		851122	1684-00047			5R5T47		MS-347	10%
C59	5000		850207	1689-00023			5R5T23		MS-323	10%
C60	470		851122		DD-471	L10T47	ED-470			10%
C61	.001	400	856251							10%
C62	.1	400	856375					GEM-401		10%
C63	.047	600	856171							10%
C64	.68	3000	856357							10%
C65	.82	3000	856103							10%
C66	.82	3000	856103							10%
C67	.1	600	856375					GEM-401		10%
C68	.82	3000								
C69	.1	600	856375					GEM-401		10%
C70	.047	400	856171							10%

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					
	RESISTANCE	WATTS	HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	802012	F1-1	RTV-819		U-S8B	Contrast
B	2Meg			R2-12	Not Req.		Not Req.	Volume Tap @ 1.5Meg
C	Switch			KS-1	Not Req.		Not Req.	
R2A	2 253Meg	½	802013	F1-64			U-S10B	Vert. Hold
B	150K	½		R2-33			Not Req.	Brightness
C	Switch			KS-1			Not Req.	Sync Lock
R3A	1Meg	½	800010					Tone
B	Switch							Phono-TV, Spot Eliminator
R4A	2Meg	½	800018	BX-75	A4T-2Meg-B	QU-133	TA36L	Height
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R5	2000Ω	3(WW)	806003		3Y-2000		FL-3.5K	Vert. Linearity
R6A	50K	½	800021	BX-31	A4T-50K-B	QU-133	TA34L	Area
B	Shaft			Not Req.	FKS-1/2	Not Req.	Not Req.	
R7A	10K	½	800009	AB-14	A4T-10K-B	BU-118	TA41L	Horiz. Drive
B	Shaft			AK-1	FKS-1/4	TMI-4M	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No	IRC PART No	
R8	470Ω		814188	BTS-470	
R9	100K		814216	BTS-100K	
R10	2.7Meg		814233		
R11	470K		814234		
R12	470K		814234		
R13	15K		814206	BTS-15K	
R14	470Ω		814188		
R15	470Ω		814188		
R16	47K		814213		
R17	470Ω		814188	BTS-470	
R18	47K		814176	BTS-47	
R19	470Ω		814188	BTS-470	
R20	470Ω		814188	BTS-470	
R21	47Ω		814176	BTS-47	
R22	47K		814212	BTS-47K	
R23	1000Ω		814183	BTS-1000	
R24	470Ω	1	814188	BTS-470	
R25	150Ω		814182	BTS-150	
R26	4700Ω		814200	BTS-4700	
R27	12K		814205	BTS-12K	
R28	3900Ω	4	814193	PW7-3900	
R29	15K		814206	BTS-15K	
R30	820Ω	1	814196	BTA-820	
R31	18K	2	813207	BTS8-18K	
R32	390Ω		814187	BTS-390	
R33	10K		814204	BTS-10K	
R34	220K		814220	BTS-220K	
R35	100K		814216	BTS-100K	
R36	100K		814216	BTS-100K	
R37	22K		814208	BTS-22K	
R38	6800Ω		814202	BTS-6800	
R39	22K		814208	BTS-22K	
R40	10K		814204	BTS-10K	
R41	180Ω		814183	BTS-180	
R42	33K		814210	BTS-33K	
R43	10Meg		814240	BTS-10Meg	
R44	270K		814232	BTS-270K	
R45	470K		814234	BTS-470K	
R46	270Ω		814185	BTS-270	
R47	100		814168	BTS-10	

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No	IRC PART No	
R48	470K		814234	BTS-470K	
R49	2.2Meg		814232	BTS-2.2Meg	
R50	330K		814232	BTS-320K	
R51	470K		814234	BTS-470K	
R52	22000 5%	1	816071	BTA-2200 5%	
R53	12000		818202	BTA-1200	
R54	18000		814195	BTS-1800	
R55	18000 5%		814063	BTS-1800 5%	
R56	470Ω	1	814188	BTS-470	
R57	4.7Meg		814236	BTS-4.7Meg	
R58	180K	2	813219	BTS8-180K	
R59	1.2Meg		814239	BTS-1.2Meg	
R60	680K	1	818223	BTA-680K	
R61	56000		814208	BTS-5600	
R62	10000 5%		814083	BTS-1000 5%	
R63	100Ω		814180	BTS-100	
R64	470Ω	1	814188	BTA-470	
R65	22K		814208	BTS-22K	
R66	560Ω		814189		
R67	560Ω		814189		
R68	15Ω	1	816177	BTA-15	
R69	100K		814216		
R70	100K		814216		
R71	4.7Meg		814236	BTS-4.7Meg	
R72	180K		814184		
R73	150K			BTS-150K	Note 1
R74	39000		814203		
R75	100K		814216		
R76	15000 5%		814087	BTS-1500 5%	
R77	47000		814300		
R78	1Meg		814238	BTS-1Meg	
R79	8200Ω	2	818203	BTS-8200	
R80	10001Ω	2	816192	BTH-1000	
R81	4700		814200		
R82	330Ω		814185		
R83	2500Ω	10	825444	PW10-2500	
R84	120Ω	10	825318		
R85	1Meg		814238	BTS-1Meg	
R86	2.2Meg		814232	BTS-2.2Meg	
R87	330K		814222	BTS-330K	

Note 1. Some versions may use a 100K (Part #814216) in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	HOFFMAN PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC @1.7A	580VCT @.280A	5V @ 3A	6.3V ② 6A EBC-4 6.3V ③ 6.3A	816004			P-8058①	P-8525	26R93 ①

① Tape 6.3V ④ 4.5A filament winding.

TRANSFORMER (REMOTE CONTROL)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI	SEC. 1	SEC. 2	SEC. 3	HOFFMAN PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	117VAC @.5A	27V @1.6A			T23001 ①					

① Used in Chassis 531.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		HOFFMAN PART No.	Halldorson PART No	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	Vert. Output	828002	Z1900 ①	A-3823	V301	A-8142 ②	26S77	A-10SX	
T4A	Yoke-Horiz.(20MH)	820003	DF807	MDF-92	V90F18/43	DY-48-A	Y-16	Y-41-A	
B	(90°)-Vert. (35.5MH)		③④⑤	③④⑤	③④⑤	④⑤	③④⑤	W44 ④⑤	
M9	Rear Cover and Centering Device	864003							
T5	Horiz. Output	852002	FB419 *	HVO-30 *	X094 *	HO-250 *	FLY-10*	D-95 *	
T6	Width Coil	778003	RF800-④①	MWC-31	D0A98	WC-5 ④⑤	WC-19 ④	WLC-5	

① Use 8 to 1 turns ratio.
② Drill new mounting hole(s).
③ Connect horizontal damping network across yoke terminals #3 and #7.
④ Use original horizontal damping network, if necessary.
⑤ Use original rear cover and centering device.
⑥ Enlarge mounting hole.
⑦ Use terminals #1 and #2.
⑧ Use red and blue terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	9	9	9	5
	7	7	7	7	7	7	7	4
	6	5	5	5	5	5	5	3
	5	3	3	3	3	3	3	2
	4	1	1	1	1	1	1	1
Correct Width Coil Arms	2 & 3	1 & 3	1 & 3	1 & 3	1 & 3	1 & 3	1 & 3	1 & 2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T7	6600Ω	2.7Ω	724004	Z1113 1	A-3020	A-3878 1	26S68	S-5Z	1 Drill one new mounting hole

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HOFFMAN PART No	GUAM PART No.	
SP1	4"	PM	6-8Ω	708003 1,2	4AJ26 1	1 Parallel and phase
SP2	6" x 9"	PM	3-4Ω	708903 1,3	9AJ1 1	2 Used in all models covered.
	8"	PM	3-4Ω	708001 1,4	8AS1 1	3 Used in Models B3234, U, M3234, U, P3234, U, B3270, U, M3271, U, P3271, U
						4 Used in Models B3261, U, M3261, U, P3261, U, B3304, U, M3304, U, P3304, U

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA				NOTES
		HOFFMAN PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	
L1	1st Video IF	762006	17-4534	TV-131	6226	
L2	2nd. Video IF	762008	17-4522	TV-130	6218	
L3	3rd. Video IF	762007	17-4536		6222	Includes 47 25MC Trap
L4	4th. Video IF	760004	17-5004	TV-138	6234	
L5	Series Peaking Coil	771008	18-5200	TV-181	6113	100 Microhenries
L6	Shunt Peaking Coil	771019		TV-207	6155	820 Microhenries
L7	4.5MC Trap	763005	30-1004	TV-151	1468 *	
L8	Series Peaking Coil	771020	18-5250	TV-185	6118	280 Microhenries
L9	Sound IF	763003	30-1004	TV-151	1468 *	
L10	Ratio Det.	774003	17-3497	TV-118	6205	

* Disregard tap

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES		REPLACEMENT DATA							
	PRI	SEC	HOFFMAN PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordarson PART No	NOTES
L11	50Ω		758004	18-1576	TV-183	6210		H-102	HS-5	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA	
K1	Vert. Integrator	2200MMF, 4700MMF, 4700MMF, 22K, 8200Ω, 8200Ω	986001	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-100 PC-100 UU75M 1405-01 V-1

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M1	Pilot Light	940S1	Type #51
M3	Tuner	710001	VHF - Used in Ch. 331U
	Tuner	713003	UHF/VHF - Used in Ch. 331U
M5	Switch	900001	Pushbutton - Ch 331
M4	Switch	900003	Pushbutton (Latching) Ch 331
M5	Switch	900001	Cycle Stop - Ch. 331
M6	Switch		Picture Blanking - Ch. 331
M7	Motor	715001	24V Motor Assembly - Ch 331
M8	Wheel	339001	Channel Pre-selector - Ch 331
M9	Centering Device	864002	Includes yoke cover
M10	Ion Trap	870002	24" Models
	Ion Trap	870001	21" Models

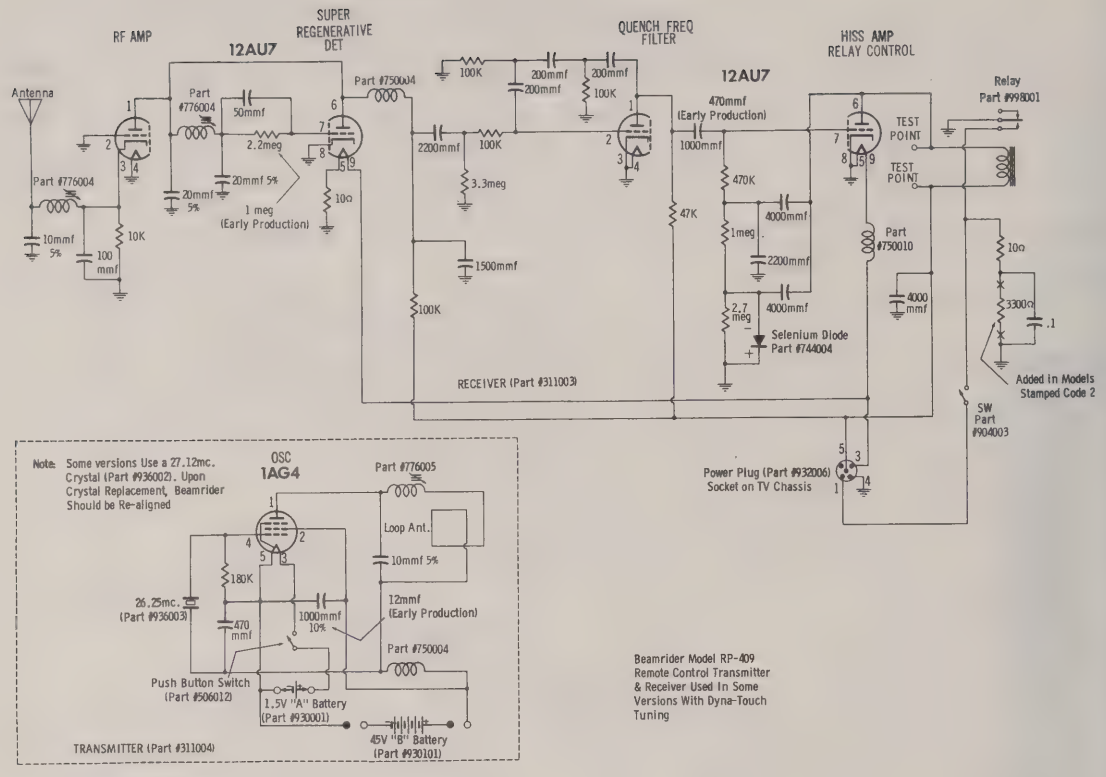
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	428002	24 " Models
Safety Glass	428003	21" Models
Mask	402002	24" Models
Mask	402001	21" Models
Escutcheon	452008	VHF - Models B3234, M3234, P3234, B3304, M3304, P3304
Escutcheon	452003	VHF - Models B3261, M3261, P3261, B3271, M3271, P3271
Escutcheon	452009	UHF - Models B3234U, M3234U, P3234U, B3304U, M3304U, P3304U
Escutcheon	452006	UHF - Models B3261U, M3261U, P3261U, B3271U, M3271U, P3271U
Knob	806004	Pushbutton Channel Selector - VHF Models
Knob	806005	Fine Tuning - VHF Models
Knob	480037	Fine Tuning - UHF-VHF Models
Knob	480030	UHF Ist. Section - UHF-VHF Models
Knob	480013	UHF 2nd. Section - UHF-VHF Models
Knob	808007	Brightness
Knob	812004	Contrast and vert. hold
Knob	800018	On-Off-volume
Knob	800004	Tone

HOFFMAN MODELS B3234, U, B3261, U, B3271, U, B3304, U, M3234, U, M3261, U, M3271, U, M3304, U, P3234, U, P3261, U, P3271, U, P3304, U (Ch. 331, U)

FOLDER 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

"BEAMRIDER" SERVICE HINTS

#1 Symptom: Tuner rotates when "Beamrider" switch is turned on.

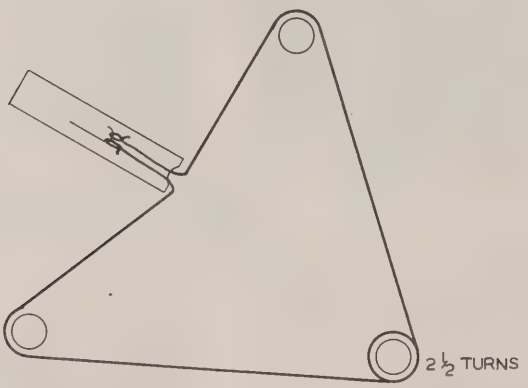
Connect VTVM to test points. A reading of 25 volts or more may be obtained while unit is operating. Shorten the antenna (tie a simple knot in it) to a point where reading drops to approximately 7 volts. If voltage does not go down trouble is in receiver. Replace tubes and check .1MFD capacitor in series with 10Ω resistor from the switch to ground.

#2 Symptom: Tuner fails to rotate.

Ground "Beamrider" antenna. If tuner rotates trouble is in transmitter. Check batteries and tube. If tuner fails to rotate, check voltage at test points for 3 to 5 volt indication. If no voltage is observed replace 12AU7 hiss amp. relay control tube.

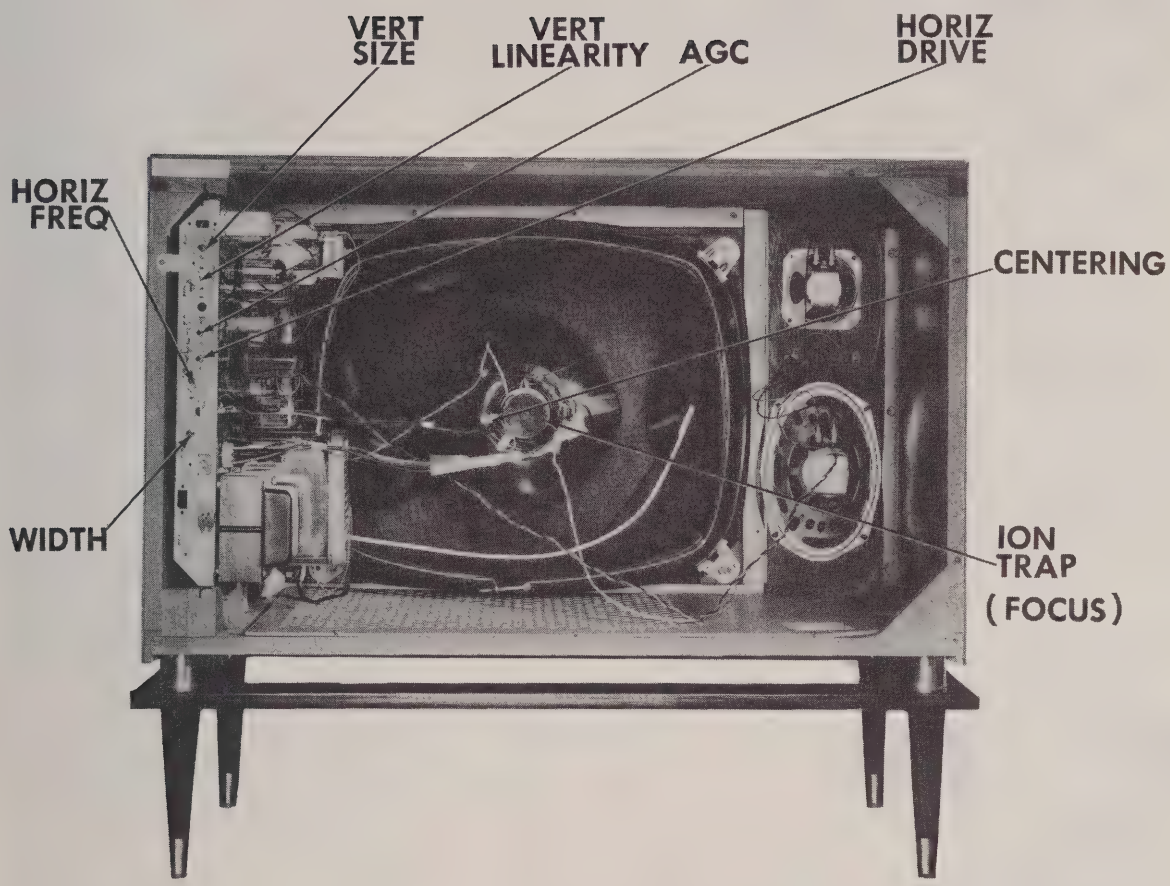
#3 Symptom: Intermittant Cycling of tuner or relay chatter.

Check voltage at test points for 3 to 5 volts indication. If a higher reading is obtained shorten antenna and check selenium diode.



FINE TUNING DRIVE CORD STRINGING

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible]
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R7) until white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

7. Adjust the width slug (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

SILVERTONE MODELS 6102, 6103 (Ch. 549.20040, 549.20050)

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DENVER, COLORADO

SILVERTONE
MODELS 6102, 6103 (Ch. 549.20040, 549.20050)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PHOTOFACT* Folder
*TRADE MARK

SILVERTONE MODELS 6102, 6103 (Ch. 549.20040, 549.20050)

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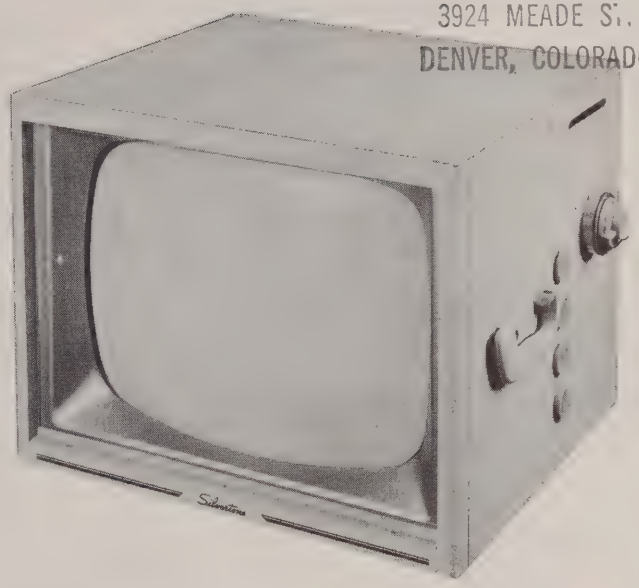
3924 MEADE ST.
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type knobs from the side.
2. Remove 2 wood screws and the rear cover.
3. Remove 2 wood screws and AC interlock.
4. Remove picture tube socket, ion trap, yoke clamp, yoke, HV lead and 2 speaker leads.
5. Remove 2 wood screws and the speaker.
6. Remove 1 wood screw from the top chassis brace.
7. Remove 2 chassis bolts from the bottom.
8. Remove the chassis.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

SILVERTONE
MODELS 6102, 6103 (Ch. 549.20040, 549.20050)

TRADE NAME	Silvertone	MODELS	CHASSIS
		6102, 6103	549.20040
		6102, 6103	549.20050
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	Television Receiver		
TUBES	Fourteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 145 Watts, 1.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws and plastic trim at the bottom. Remove the safety glass.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10, or 6 and 2. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

FUSE DEVICE

A 4.7Ω fusible resistor (R74) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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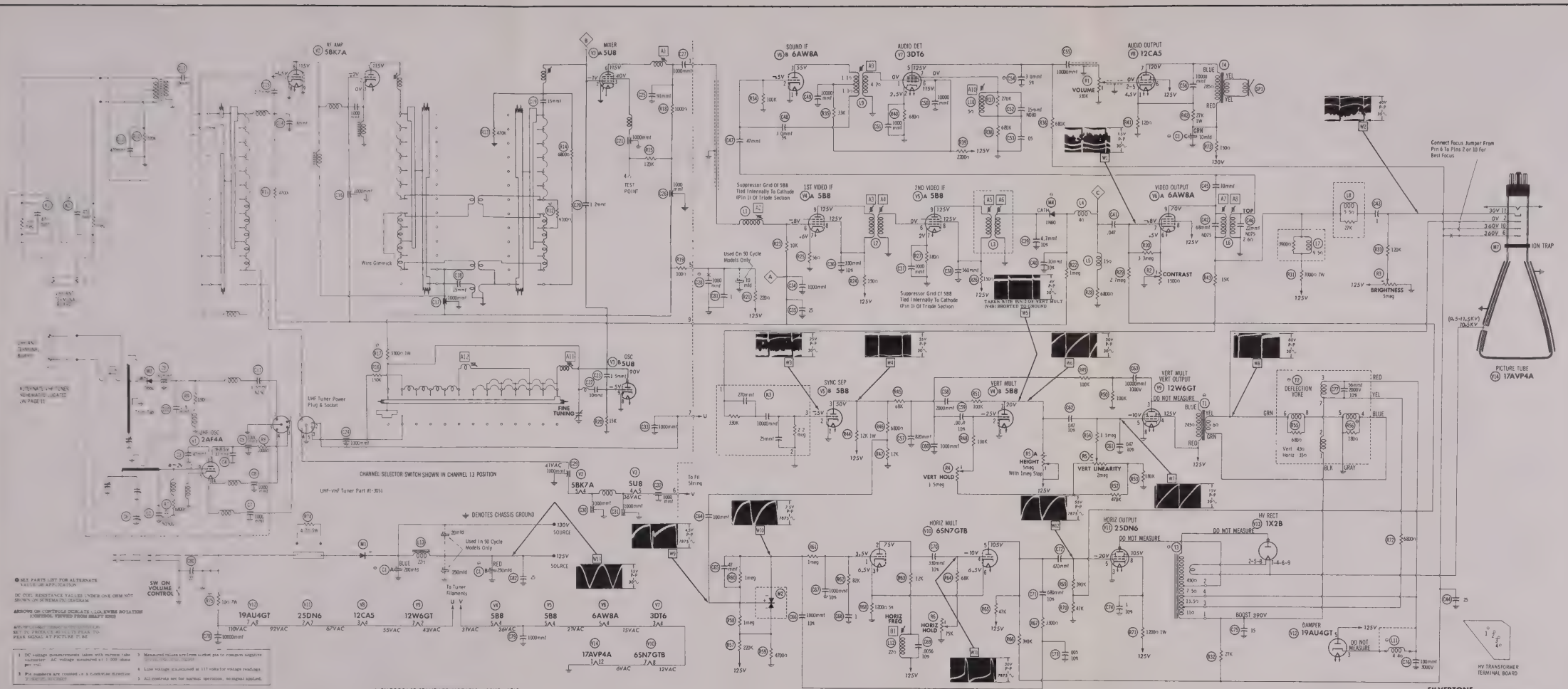
RF AMP V1 5BK7A
MIXER V3 A 5U8
SOUND IF V6 B 6AW8A
AUDIO DET V7 3DT6
AUDIO OUTPUT V8 12CA5
VOLUME
1ST VIDEO IF V4 A 5B8
2ND VIDEO IF V5 A 5B8
VIDEO OUTPUT V2 A 6AW8A
CONTRAST
BRIGHTNESS
TOP
OSC V3 B 5U8
UHF OSC 2AF4A
FINE TUNING
SYNC SEP V5 B 5B8
VERT MULT V4 B 5B8
VERT MULT VERT OUTPUT V9 12W6GT
DO NOT MEASURE
VERT HOLD
VERT LINEARITY
HEIGHT
DEFLECTION YOKE
HORIZ MULT V10 6SN7GTB
HORIZ OUTPUT V11 25DN6
HV RECT V13 1X2B
DAMPER V12 19AU4GT
BOOST 390V
ION TRAP
PICTURE TUBE V14 17AVP4A
Connect Focus Jumper From Pin 6 To Pins 2 or 10 For Best Focus
Suppressor Grid Of 5B8 Tied Internally To Cathode (Pin 1) Of Triode Section
Used On 50 Cycle Models Only
TAKEN WITH EVA 2 OR VERT MULT (V4B) SHORTED TO GROUND
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
UHF-VHF Tuner Part #1-3054
UHF Tuner Power Plug & Socket
DENOTES CHASSIS GROUND
120V SOURCE
125V SOURCE
To Tuner Filaments
To Fil String
SW ON VOLUME CONTROL
Wire Gimmick
TEST POINT
HV TRANSFORMER TERMINAL BOARD
19AU4GT 7A7 110VAC
25DN6 7A7 92VAC
12CA5 7A3 67VAC
12W6GT 7A3 55VAC
5B8 5A3 43VAC
5B8 5A3 37VAC
6AW8A 5A1 26VAC
3DT6 3A1 21VAC
17AVP4A 1A12 15VAC
6SN7GTB 7A8 6VAC
12VAC
SILVERTONE
MODELS 6102, 6103 (Ch. 549.20040, 549.20050)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

TUBE PLACEMENT CHART

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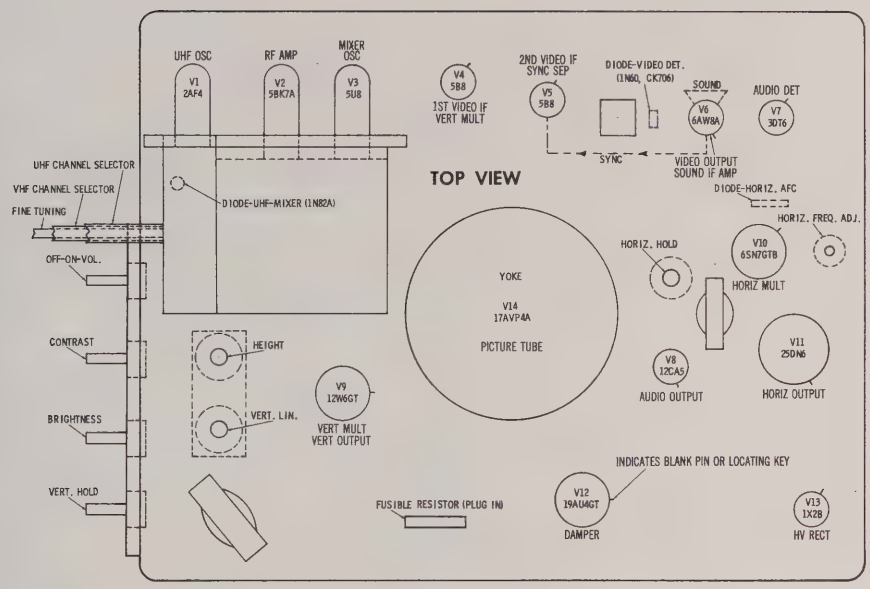


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

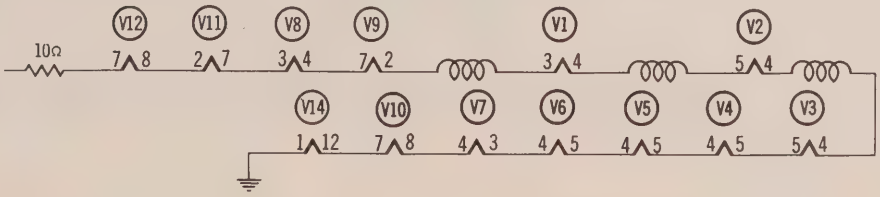
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R74), Rectifier (M1)**

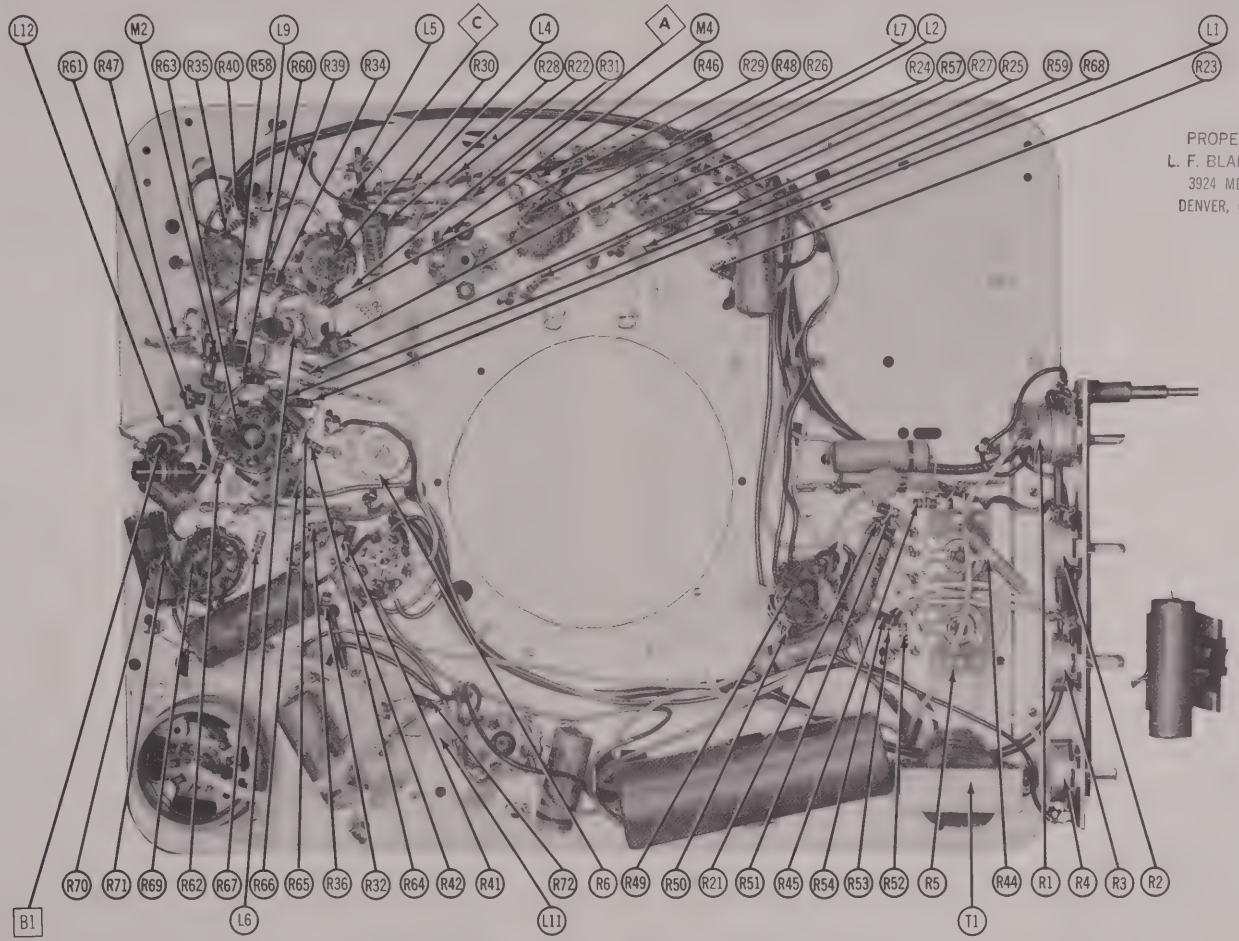
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V4, V5, Diode (M4), V6**
No pic, no sound, has snow - **V2, V3, (V1 UHF)**
No pic, has sound, has raster - **V6, V14**
Has pic, no sound - **V6, V7, V8**

SYNC FAILURE
No vert. sync - **V5**
No horiz. sync - **V5, Diode (M2)**
No vert. or horiz. sync - **V5**

SWEEP FAILURE
No raster, has sound - **M2, V10, V11, V12, V13, V14**
No vertical deflection - **V4, V9**
Poor vert. linearity or foldover - **V4, V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, M1**
Vert. off freq. - **V4, V9**
Horiz. off freq. - **V10**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CHASSIS BOTTOM VIEW - RESISTOR INDUCTOR OF ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Allow a 20 minute warm-up period for the receiver and test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Disable the oscillator section of the mixer oscillator tube by replacing with one having the oscillator grid pin removed.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to point Ⓑ. Low side to chassis.	44.5MC	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V4). Low side to chassis.	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
2.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V5). Low side to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V5). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A5, A6	"
4.	"	High side to point Ⓑ. Low side to chassis.	"	"	"	"		Check for response curve similar to Fig. 3. If necessary, SLIGHTLY retouch A1 thru A6 for desired response.

SOUND IF ALIGNMENT

Set the contrast control fully clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000MMF	High side to point Ⓒ. Low side to chassis.	Not used	4.5MC (30% 400∿ AM Mod)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube.	A7	Preset A7 fully clockwise. Preset A10 fully counter clockwise. Turn A7 counter clockwise for MINIMUM 400∿ indication on scope.
6.	"	"	4.5MC (7.5KC Swp)	Not used	"	Across secondary of audio output transformer (T4).	A8, A9, A10	Keep signal input below limiting level of 3DT6 (audio detector, V7). Adjust A8, A9, & A10 for maximum scope indication.

Connect antenna and tune in a TV station with strong signal. Retouch A8 for MINIMUM buzz. Repeat step 2.

OSCILLATOR ALIGNMENT

Restore the receiver to normal operating condition. Set the channel selector to the highest high band channel (13-7) operating in the area and set the fine tuning to the center of its range. Adjust the high band oscillator adjustment (A11) for best picture and sound.
Switch channel selector to the highest low band channel (6-2) operating in the area and adjust the low band oscillator adjustment (A12) for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

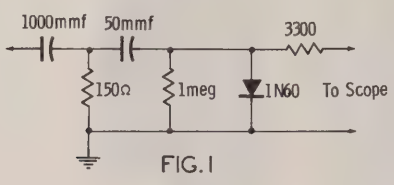


FIG. 1

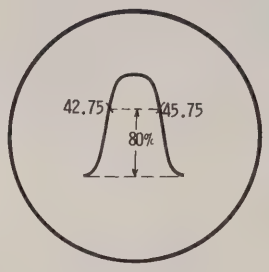


FIG. 2

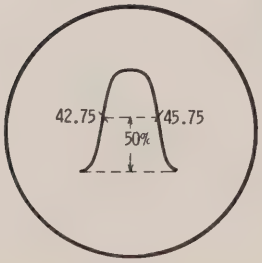


FIG. 3

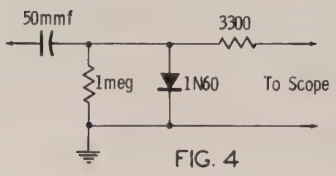
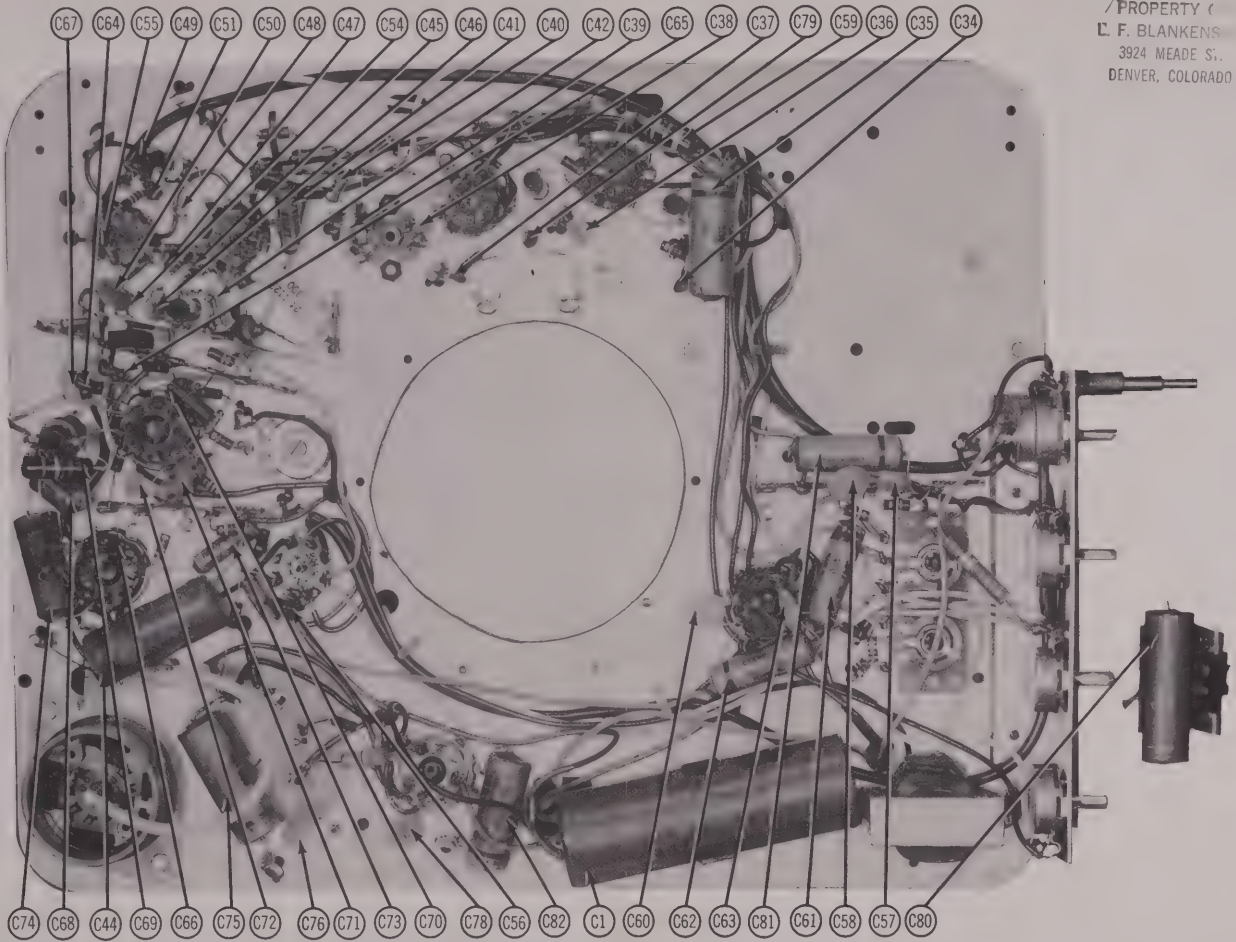


FIG. 4

PROPERTY OF
L. F. BLANKENSHIP
3924 MAINE ST.
DENVER, COLORADO

CHASSIS TOP VIEW



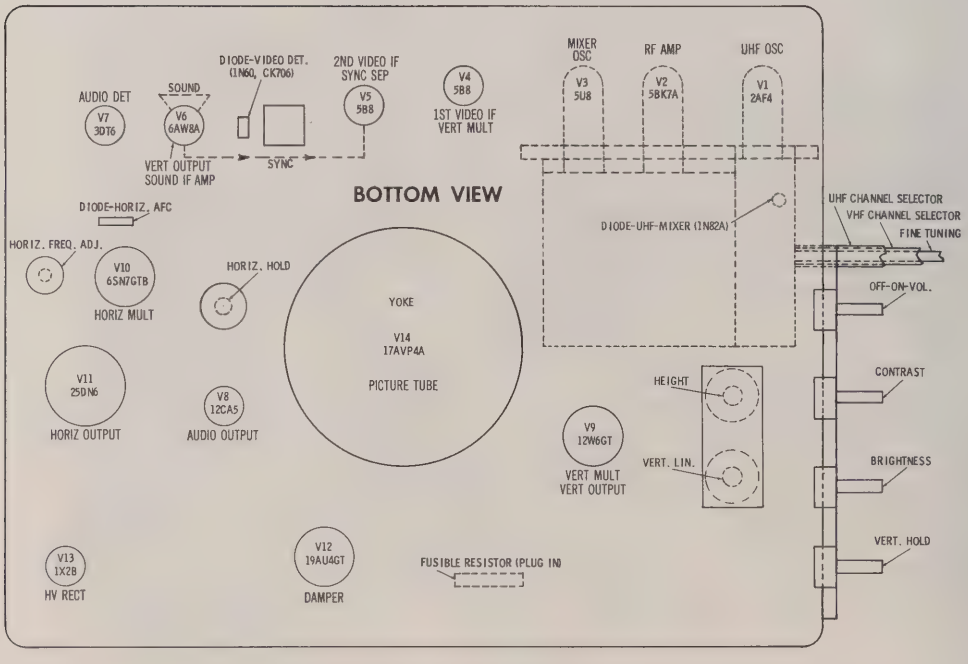
PROPERTY OF
L. F. BLANKENS
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2AF4	† 4600Ω	6800Ω	11.5Ω	12Ω	.1Ω	6800Ω	† 4600Ω		
V2	5BK7A	† 320Ω	1Meg	.1Ω	10.5Ω	11.5Ω	† 320Ω	1Meg	0Ω	0Ω
V3	5U8	† 3600Ω	470K	† 120K	10.5Ω	9Ω	† 1300Ω	0Ω	0Ω	15K
V4	5B8	0Ω	• 1.2Meg	• † 2.2Meg	8Ω	9Ω	1Meg	56Ω	† 170Ω	† 170Ω
V5	5B8	0Ω	2.2Meg	† 9000Ω	7Ω	8Ω	.1Ω	180Ω	† 170Ω	† 170Ω
V6	6AW8A	0Ω	100K	† 35K	4.5Ω	7Ω	• 190Ω	1.5Meg	† 22Ω	† 3300Ω
V7	3DT6	4.2Ω	680Ω	4.5Ω	3.5Ω	‡700K	† 2200Ω	680K		
V8	12CA5	120Ω	0Ω	17Ω	14.5Ω	0Ω	† 22Ω	† 435Ω		
V9	12W6	TP	12Ω	† 260Ω	† 22Ω	• 2.3Meg	TP	14.5Ω	0Ω	
V10	6SN7GTB	2.4Meg	† 12K	1200Ω	• 85K	† 47K	1200Ω	1.5Ω	3.5Ω	
V11	25DN6	TP	22Ω	0Ω	TP	400 K	TP	17Ω	† 1200Ω	TOP CAP ‡ 12Ω
V12	19AU4GT	NC	TP	¶	NC	† 22Ω	NC	25Ω	22Ω	
V13	1X2B		PINS	1 THRU 9	HAVE	INFINITE	RESISTANCE			TOP CAP ‡460Ω
V14	17AVP4A	0Ω	11Ω	PIN 6 ‡27K	PIN 10 ‡27K	PIN 11 • 600K	PIN 12 1.5Ω			

† MEASURED FROM 130V SOURCE.
‡ MEASURED FROM PIN 3 OF V12.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

SILVERTONE MODELS 6102, 6103 (Ch. 549.20040, 549.20050)

ALTERNATE TUNER SCHEMATIC

FOLDER 4

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE S.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	UHF Oscillator	2AF4	
V2	RF Amplifier	5BK7A	
V3	Mixer-Inverter	5U8	
V4	1st. Video IF Amp. - Vert. Multi.	5B8	
V5	2nd. Video IF Amp. - Sync Separator	5B8	
V6	Video Output-Sound IF Amp	6AW8A	

ITEM No	USE	TYPE	NOTES
V7	Audio Detector	3DT6	
V8	Audio Output	12AU6	
V9	Vert. Mult. -Vert. Output	12W6	
V10	Horiz. Mult.	6SN7GTB	
V11	Horiz. Output	25Q6G	
V12	Damper	19AL4GT	
V13	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V14	17AVP4A	17AVP4A 17ATP4A	17AVP4A 17AYP4A 2 17ATP4 17AY4	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	300	150	PR3-01	XCO128	WT330	CDB-T-1015		D-096	R3294 *
B	350	150						MT-1513	
C	10	150							

① Some versions may use Part #45C391 in this application.
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	23									M500
C2	47									
C3	47									
C4	1000			RF-001	MPT-1000				503C-DI	
C5										
C6	1000			RF-001	MPT-1000				503C-DI	
C7	1000			RF-001	MPT-1000				503C-DI	
C8	1000			RF-001	MPT-1000				503C-DI	
C9	1									
C10	4.6									
C11	1.5									M30
C12	470		BPD-00047	DD-471	BYA107A7	ED-470	UC-5347		SGA-T47	
C13	10		SI 10	DS-100	LT9Q3	GP-10	UC-541		SGA-Q1	
C14	18									
C15	2.7									
C16	1000			RF-001	MPT-1000				503C-DI	
C17	1000			RF-001	MPT-1000				503C-DI	
C18	15			BPD-000015	DD-150	LJQG15	ED-15	UC-5415	SGA-Q15	
C19	15			BPD-000015	DD-150	LJQG15	ED-15	UC-5415	SGA-Q15	
C20	1.3									
C21	1000			RF-001	MPT-1000				503C-DI	
C22	30			BPD-00001	DD-100	LJQG1	ED-10	UC-541	SGA-Q1	
C23	1.5			NPO-811.5	C10V15C	TCC-1.5	TCO-1.5	ZT-5125	TCCB-V15	
C24	1000			RF-001	MPT-1000				503C-DI	
C25	91									
C26	1000			RF-001	MPT-1000				503C-DI	
C27	1000			BPD-001	DD-102	BYA8D1	ED-1000	DC52L	502C-DI	
C28	1000		47A330	BPD-001	DD-102	BYA8D1	ED-1000	DC52L	88K-DI	Note 1
C29	1000			RF-001	MPT-1000				503C-DI	
C30	1000			RF-001	MPT-1000				503C-DI	
C31	1000			RF-001	MPT-1000				503C-DI	
C32	1000			BPD-001	DD-102	BYA8D1	ED-1000	DC52L	88K-DI	
C33	1000			BPD-001	DD-102	BYA8D1	ED-1000	DC52L	88K-DI	
C34	1000		47A230		DD-103	BYA8D1	ED-1000	DC52L	88K-DI	
C35	.35	300	45A7354J	P388N-35		CUB2P35		GEM-3035	TTM-P35	
C36	.35		47A54		DS-331	LJQT33	ED-330		SGA-Q47	10%
C37	1000		47A300	BPD-001	DD-102	BYA8D1	ED-1000	DC52L	88K-DI	
C38	560		47-542		DD-561	BYA107S6	ED-560	UC-5356	SGA-T56	
C39	4.7		47B402-6	NPO-E4.7	TC2-4R7	C10V47C	TCO-4.7	ZT-5647	TCCCB-V47	10%
C40	10		47CA10A100K	NPO-E10	TCZ-10	C10QKC	ED-10	ZT-541	TCCC-Q	10%
C41	.047	200	45M1647AM3							
C42	68		47-535							NOTE
C43	.035	300	45A1054J	P388N-1	DF-104	CUB2P1		GEM-301	TTM-P1	
C44	35	600								
C45	10		SI 10	DS-100	LT9Q3	GP-10	UC-541		SGA-Q1	
C46	33		47-535							NOTE
C47	47		47CA30A470M	SI 47	DS-471	LT6Q47	GP-47	UC-5447	SGA-Q47	
C48	5.0		47A307	NPO-S1 3.0		C10V5C	TCO-3.0	ZT-5533		5%
C49	10000		47A334	BPD-01	DD-103	BYA8E1	ED-01	DC51	58K-SI	
C50	10000		47A334	BPD-01	DD-103	BYA8E1	ED-01	DC51	58K-SI	
C51	1000		47A350	BPD-001	DD-103	BYA8D1	ED-1000	DC52L	58K-DI	
C52	15		47B430							NOTE
C53	.05	300	45A1050J	P388N-06	DF-503	CUB4P5		GEM-415	TTM-S5	5%
C54	3.0		47A307	NPO-S1 3.0		C10V3C	TCO-3.0	ZT-5533		Note 2
C55	10000		47A334	BPD-01	DD-103	BYA8E1	ED-01	DC51	58K-SI	
C56	10000		47A334	BPD-01	DD-103	BYA8E1	ED-01	DC51	58K-SI	
C57	10000		47-606		DD-521	LJQT52	ED-530		SGA-T52	
C58	2000		47A396	BPD-003	DD-203	BYA10D8	ED-002	DC53	58K-DS	
C59	.0039	600	45B2432E4							10%
C60	1000		47-505	BPD-001	DD-103	BYA8D1	ED-1000	DC52L	58K-DI	
C61	.047	600	45A9473E							10%
C62	.047	600	45A9473E							10%
C63	10000	1000	47-605			BYA10E1				
C64	100		47CA01A101M	SI 100	DS-101	LT9T1	GP-100	UC-531	SGA-T1	
C65	47		47CA30A470M	SI 47	DS-470	LT6Q47	GP-47	UC-5447	SGA-Q47	
C66	1000		47A586				ED-1000			10%
C67	1000		47A586				ED-1000			10%
C68	.1	350	46A1054J	P388N-1	DF-104	CUB2P1		GEM-301	TTM-P1	
C69	.0068	400	46A1563E4							10%
C70	330		47X330S1K	1469-00033		5RST33			MS-333	10%
C71	330		47X330S2K	1464-00068		1RST68			MS-333	10%
C72	470			NPO-E0047	DD-471	BYA107A7	ED-470	UC-5347	SGA-T47	
C73	.006	300	46A1502E							10%
C74	.1	600	46A343							10%
C75	.15	600	46B1534L5	P688N-15		CUB6P15		GEM-6015	TTM-P15	
C76	100	1000	47-570	BPD-001	DD30-101	BYB30Y1	ED8-100	DC9301	90DA-T1	
C77	56	2000	47A657							10%
C78	10000		47A334	BPD-01	DD-103	BYA8E1	ED-01	DC51	58K-SI	
C79	10000		47A334	BPD-01	DD-103	BYA8E1	ED-01	DC51	58K-SI	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C79	1000		47A330	BPD-001		DD-103	BYA8D1		502C-DI	
C80	.22	600		P688N-22			CUB6P22		GEM-6022	
C81	.1	300	46A1104J	P384N-1		DF-104	CUB4P1		GEM-301	TTM-P1
C82	.33	300	46A3354J	P384N-35			CUB4P35		GEM-3035	TTM-P25

Note 1. Used in UHF-VHF models only.
Note 2. Some versions may use a 1000MMF (Part #47A230, in this application.

CONTROLS

ITEM No	RATING: RESIST ance	WATTS	REPLACEMENT DATA: SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	330K	½	25B1101	AB-80	A47-500K-8	Q33-132	TA334A	Volume
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-13	78-1	US-26	
R2A	.500Ω	½	25B1103	AB-818		QT-109	U8	Contrast
B	Shaft			AK-7		Not Req.	Not Req.	
R3	5Meg	½	25B1254			A47-5Meg-8	TA568	Brightness
R4A	1 5Meg	½	25B1250	AB-743	A47-1.5Meg-8	Q31-138	TA1551	Vert. Hold
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
R5A	5Meg	½	25B1360	AB-86 *	A47-5Meg-8*	RU-41 *		Height with 1Meg stop
B	Shaft			AK-19	RN-3	TM3-K1t		
C	2Meg	½		AB-75	A47-2Meg-8	RU-129		Vert. Lin.
D	Shaft			AK-19	RN-3	TM3-K1t		
R6A	75K	½	25B1305	AB-25	A47-75K-8	RU-135	PT-A151	Horiz. Hold
B	Shaft			AK-4	RN-3	TM3-K1t	Not Req.	

* Use a 1Meg resistor in series with the right hand terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R7	680Ω		23X2X682X	BTS-680	
R8	1000Ω		23X2X102X	BTS-1000	
R9	150Ω		23X2X151X	BTS-150	
R10	120K		23X3X124X	BTS-120K	
R11	4700Ω		23X2X472X	BTS-4700	
R12	8000Ω		23X3X802X	BTS-8100	Note 1
R13	470K		23X3X474X	BTS-470K	
R14	6800Ω		23X2X682X	BTS-6800	
R15	180K		23X3X184X	BTS-180K	
R16	150K		23X3X154X	BTS-150K	
R17	33000Ω	½	23X3X333X	BTA-3300	Note 2
R18	1000Ω		23X2X102X	BTS-1000	
R19	100Ω		23X2X101X	BTS-100	
R20	15K		23X3X153X	BTS-15K	
R21	330K		23X3X334X	BTS-330K	
R22	1Meg		23X3X105X	BTS-1Meg	
R23	10K		23X3X103X		
R24	100Ω		23X3X101X	BTS-150	
R25	56Ω		23X3X560X	BTS-56	
R26	150Ω		23X3X151X	BTS-150	
R27	180Ω		23X3X181X	BTS-180	
R28	6800Ω		23X3X682X	BTS-6800	
R29	2.7Meg		23X3X278X	BTS-2.7Meg	
R30	3.3Meg		23X3X336X	BTS-3.3Meg	
R31	3300Ω	?	24-123	PWT-3300	
R32	27K		23X3X273X	BTS-27K	
R33	130K		23X3X134X	BTS-130K	
R34	100K		23X3X104X	BTS-100K	
R35	33K		23X3X333X	BTS-33K	
R36	680K		23X3X684X	BTS-680K	
R37	270K		23X3X274X	BTS-270K	
R38	680K		23X3X684X	BTS-680K	
R39	3300Ω		23X3X333X	BTS-3300	
R40	68Ω		23X3X68X	BTS-680	

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R41	120Ω		23X3X120X	BTS-120	
R42	27K	½	23X3X273X	BTA-27K	
R43	15K		23X2X153X	BTS-15K	
R44	12K	½	23X3X123X	BTA-12K	
R45	68K		23X2X683X	BTS-68K	
R46	6800Ω		23X2X682X	BTS-6800	
R47	12K		23X2X123X	BTS-12K	
R48	100K		23X2X104X	BTS-100K	
R49	100K		23X2X104X	BTS-100K	
R50	100K		23X2X104X	BTS-100K	
R51	100K		23X2X104X	BTS-100K	
R52	470K		23X2X474X	BTS-470K	
R53	180K		23X2X184X	BTS-180K	
R54	1.5Meg		23X2X155X	BTS-1.5Meg	
R55	680Ω		23X2X68X		
R56	180Ω				Note 3
R57	220K		23X3X224X		
R58	1Meg		23X3X105X		
R59	4700Ω		23X3X472X	BTS-4700	
R60	1Meg		23X2X105X		
R61	1Meg		23X2X105X		
R62	82K		23X3X823X		
R63	12K		23X3X123X		
R64	68K		23X2X683X		
R65	47K		23X3X473X	BTS-47K	
R66	220K		23X2X224X		
R67	3300Ω		23X3X332X		
R68	12000Ω 5%		23X3X123J	BTS-1200 5%	
R69	2490K		23X2X294X	BTS-2490K	
R70	47K		23X3X473X	BTS-47K	
R71	12000Ω	½	23X3X123X	BTA-1200	
R72	68000Ω		23X3X683X		
R73	150Ω		23X3X151X	BTS-150	
R74	4.7Ω	5	24-118		
R75	10Ω	7	24-110	PWT-10	Note 4

Note 1. Some versions may use 82000 in this application.
Note 2. Some versions may use 39000 in this application.
Note 3. Some versions may use 2200 in this application
Note 4. Chassis 549.20040 use a 15Ω, 7W (Part #24-109) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T1	Vert. Output	55A303	Z1900 ①	A-2822 ②			26S71	A-108X ②	
T2A	All. Vert. Output	55-303							
B	Yoke-Horiz (35MS) (90°) Vert. (45MS)	53C396	DF-807 ①	MDF-92 ②	27W0F15/45 ③	DY-16A ④	Y-16 ④	Y-41 ⑤	
	Alt. Yoke	53-396							
	Yoke Rear Cover	8-2222							
	Centering Device	21B216							
T3	Horiz. Output	55-301		HVO-134	X154				
	Alt. Horiz. Output	55C301		HVO-134	X154				

① Use 8 to 1 horiz ratio.
② Drill new mounting hole(s).
③ Use original rear cover and centering device and original yoke damping network, if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T4	4100Ω	3-4Ω	55C302	Z1107 ①	A-3026	A-3328	24S48	S-5X	① Drill one new mounting hole.

SPEAKER

ITEM No	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: SILVERTONE PART No.	QUAM PART No
SP1	4"	PM	3-4Ω	85C175	4A07

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA: SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st. Video IF	51-2157	17-4534	TV-121	6238	
L2	2nd. Video IF	51-2166				
L3	3rd. Video IF	51-2155				
L4	RF Choke	53A307	19-1006		6834	18 Microhenries
L5	Shunt Peaking Coil	51-2158		TV-227	6194	408 Microhenries
L5A	4.5MC Trap	51B1996		TV-120		
L6	1st. Sound IF					
L7	Shunt Peaking Coil	51-2151	19-6400 ①		6134 ①	395 Microhenries, wound on 300Ω resistor
L8	Series Peaking Coil	51A1894	19-3100 *	TV-198 *	6130 *	180 Microhenries, wound on 27K resistor
L9	2nd. Sound IF	51-2156				
L10	Quadrature Coil	51A1897	20-1006	TV-121	1480	
L11	RF Choke	53-343			6811	7.8 Microhenries, IRC part #C1A - Note 1

① Not used in some versions.
* Parallel 300Ω resistor
* Parallel 27K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI	SEC	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	BCA TYPE No.	Ram PART No	Thordorson PART No	NOTES
L12	22Ω		51-2169	19-1575	MWC-13	6810 *			8S-4	

* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: SILVERTONE PART No	Halldorson PART No	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No
L13	.340A	22Ω	.8 HY.	58A350					C-37X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No	REPLACEMENT DATA
X1	Ant. Isolation	470MMF, .3-1Meg	49-073 ①	Centralab RC-471
X2	Ant. Isolation	470MMF, .3-1Meg	49-073 ①	Centralab RC-471
X3	Sync Coupler	370MMF, 10000MMF, 35MMF, 330K, 2.2Meg	49A048	Aerovox PA-533 Centralab PC-383 Sprague ST-3

① Used in UHF-VHF models only.

RECTIFIERS

ITEM No	RATING: CURRENT (Measured)	REPLACEMENT DATA: SILVERTONE PART No.	FEDERAL PART No.	GENERAL INSTRUMENT PART No.	INTERNATIONAL PART No	SARKES TARZIAN PART No.	NOTES
M1	.300A	27C238 ①	1032A ①	A100D7 ②	R3250B1 ①	350 ①	① Selenium type.
M2		27C238 ①	1215 ① ②		1171 ① ②		② Germanium type. ③ Two required.

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA: SILVERTONE PART No.	CBS PART No.	SYLVANIA PART No	NOTES
M3	D680		1N83A	1N82A	UHF Mixer (Clip-in)
M4	1N80 *	19C1864	1N80	1N80	Video Det. (Pigtail)

* A CK-706A may be used in some versions

MISCELLANEOUS

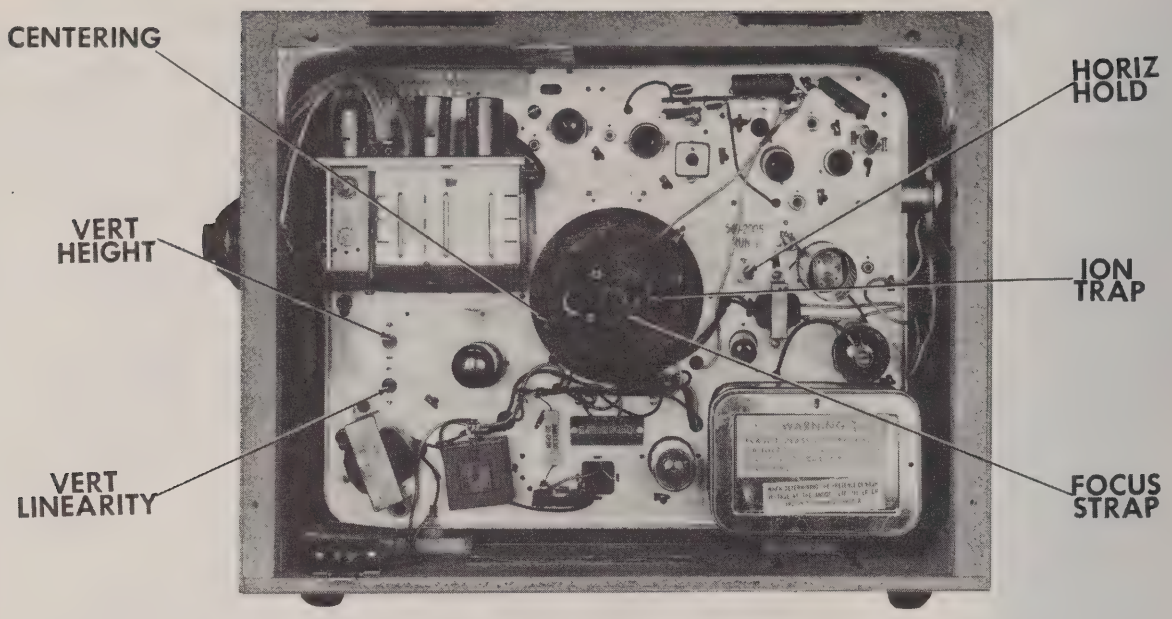
ITEM No	PART NAME	SILVERTONE PART No.	NOTES
M5	Tuner	1-3051	UHF/VHF Models
M6	Tuner	1-3067	VHF Models
M6	Centering Device	21B216	
M7	Ion Trap	21B189	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO. *	DESCRIPTION
Safety Glass	22C423	
Mask	7A815	
Knob	15C987	Channel Selector
Knob	15-947	Channel Selector (Blonde)
Knob	15B984	VHF Fine Tuning
Knob	15C985	UHF Tuning
Knob	15C986	UHF Calibrated
Knob	15D762	Fine Tuning (Clear)
Knob	15A788	Control (Blonde)
Cabinet	41-6074-6102	Wood Table
Cabinet	41-6075-6103	Wood Table

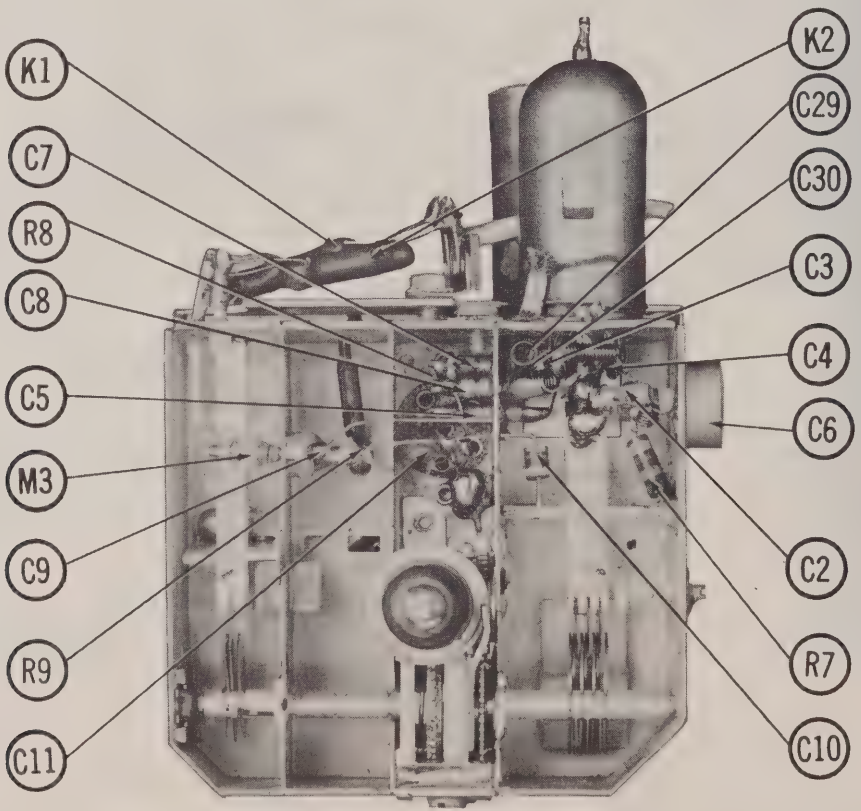
MODELS 6102, 6103 (Ch. 549.20040, 549.20050)
SYLVANIA
FOLDER 4



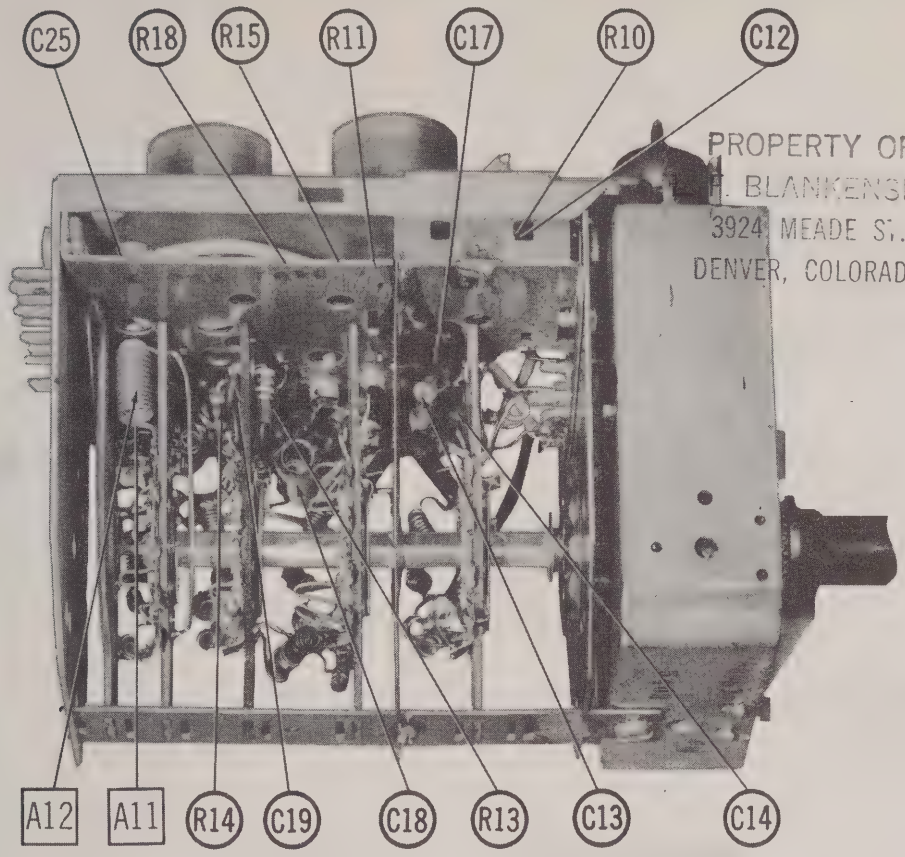
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control at the center of its range.	Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.



RF TUNER FRONT VIEW



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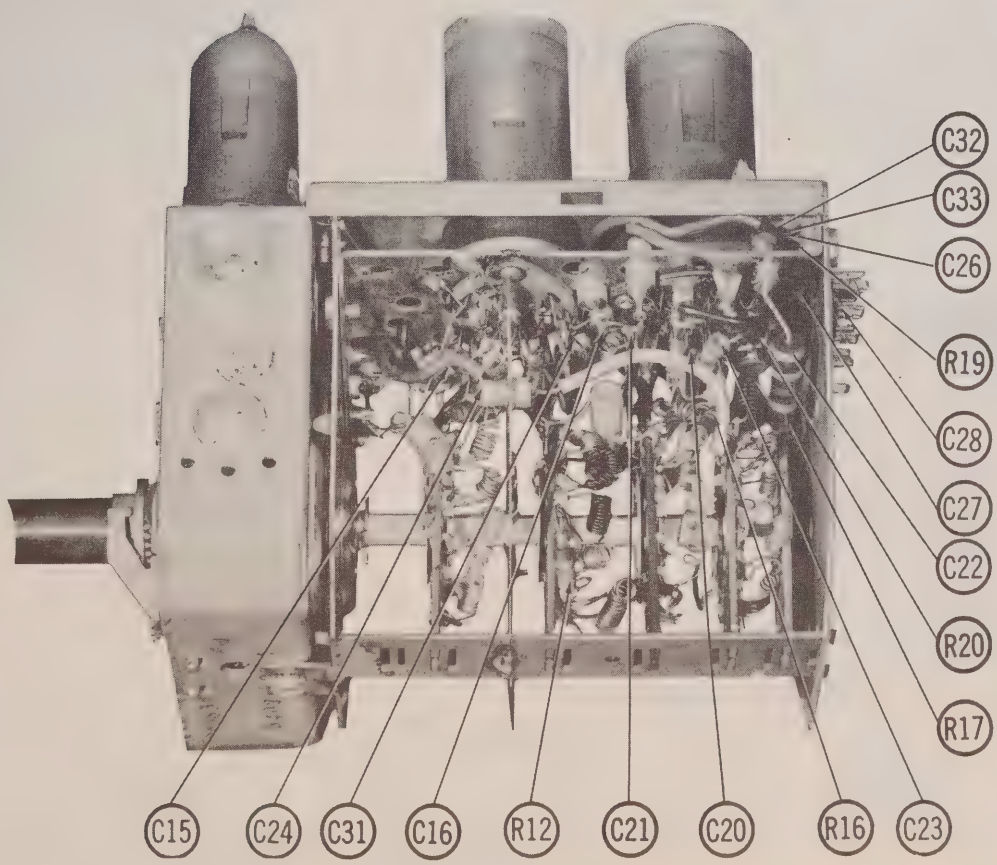
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

PHOTOFACT* Folder

*TRADE MARK

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MODEL 721-T-760 (Ch. 836-17)

TRAV-LER MODELS 721-K-120, U, 721-K-765, U, 721-K-767, U, 721-LP-800, U, 721-MT-110, U, 721-T-111, U, 721-T-760, U, 721-TL-112, U (Ch. 835-17, 836-17, 837-17, 838-17)

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FOLDER 5

PHOTOFACT* Folder
*TRADE MARK

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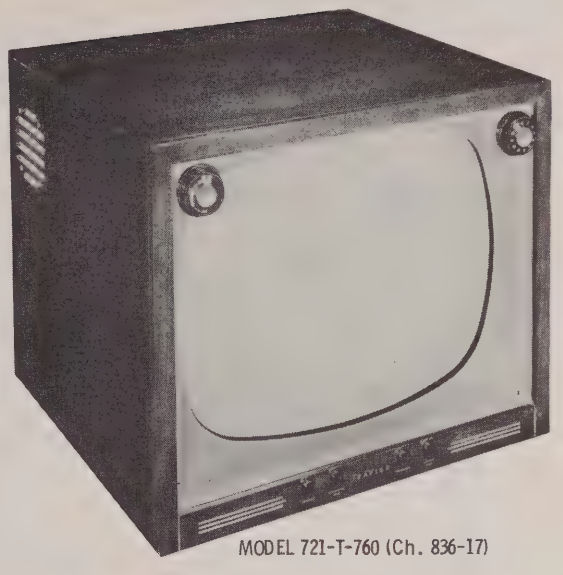
TRAV-LER MODELS 721-K-120, U, 721-K-765, U, 721-K-767, U, 721-LP-800, U, 721-MT-110, U, 721-T-111, U, 721-T-760, U, 721-TL-112, U (Ch. 835-17, 836-17, 837-17, 838-17)



MODEL 721-T-760 (Ch. 836-17)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type knobs from the front.
2. Remove 4 wood screws and the rear cover.
3. Remove the picture tube socket, yoke plug, HV head, 2 tuner plugs and 2 speaker leads.
4. Remove 2 wood screws and the volume control bracket.
5. Remove 5 chassis bolts from the bottom.
6. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Trav-Ler	MODELS	CHASSIS
		721-K-120, 721-MT-110, 721-T-111, 721-TL-112	835-17
		721-K-765, 721-K-767, 721-LP-800, 721-T-760	836-17
		721-K-765U, 721-K-767U, 721-LP-800U, 721-T-760U	837-17
		721-K-120U, 721-MT-110U, 721-T-111U, 721-TL-112U	838-17
MANUFACTURER	Trav-Ler Radio & Television Corp., 571 W. Jackson Blvd., Chicago 6, Illinois		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 140 Watts, 1.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ALIGNMENT

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE AND SAFETY GLASS CLEANING

Remove 7 push-on type knobs from the front, 4 wood screws and the rear cover, 2 tuner plugs, 2 speaker leads, and 2 wood screws holding the volume control bracket. Remove 8 cabinet bolts from the bottom. Slide cabinet forward and lift off.

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

FUSE DEVICE

A 7.5Ω fusible resistor (R100) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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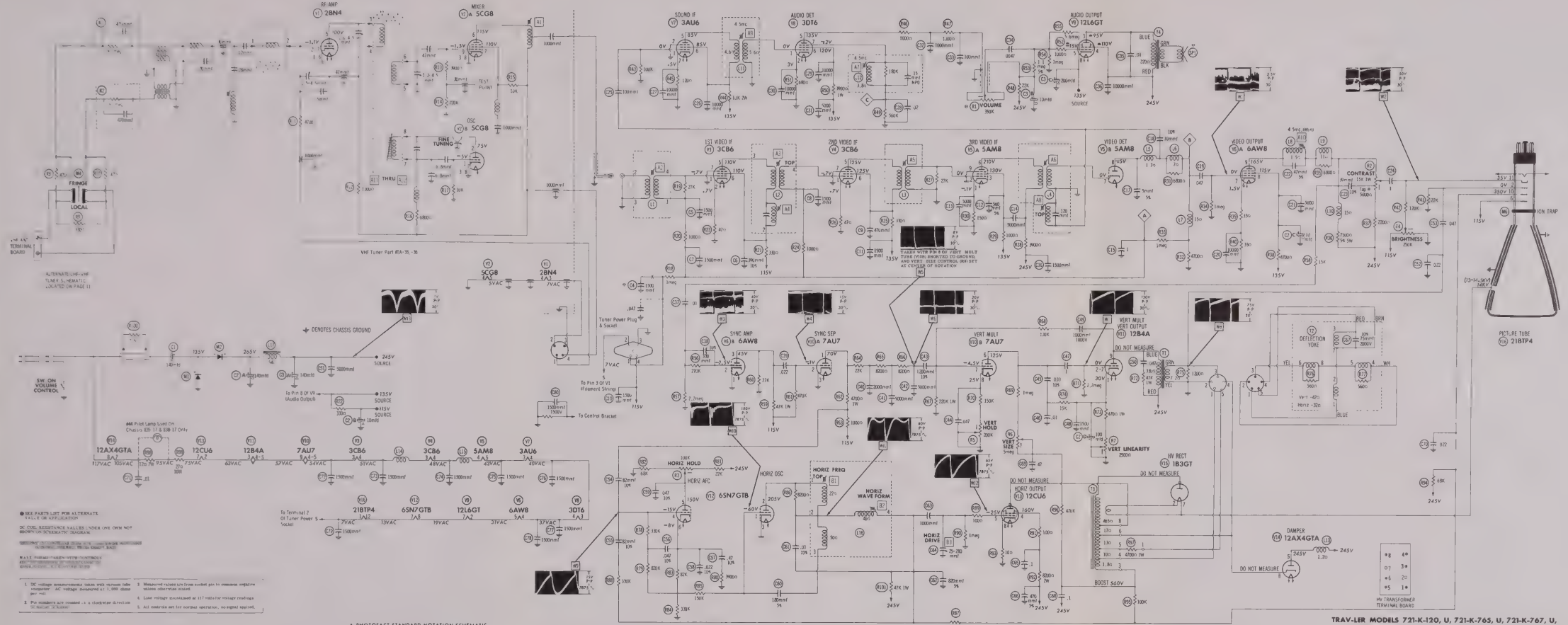
H221

DATE 12-57 SET 380 FOLDER 5

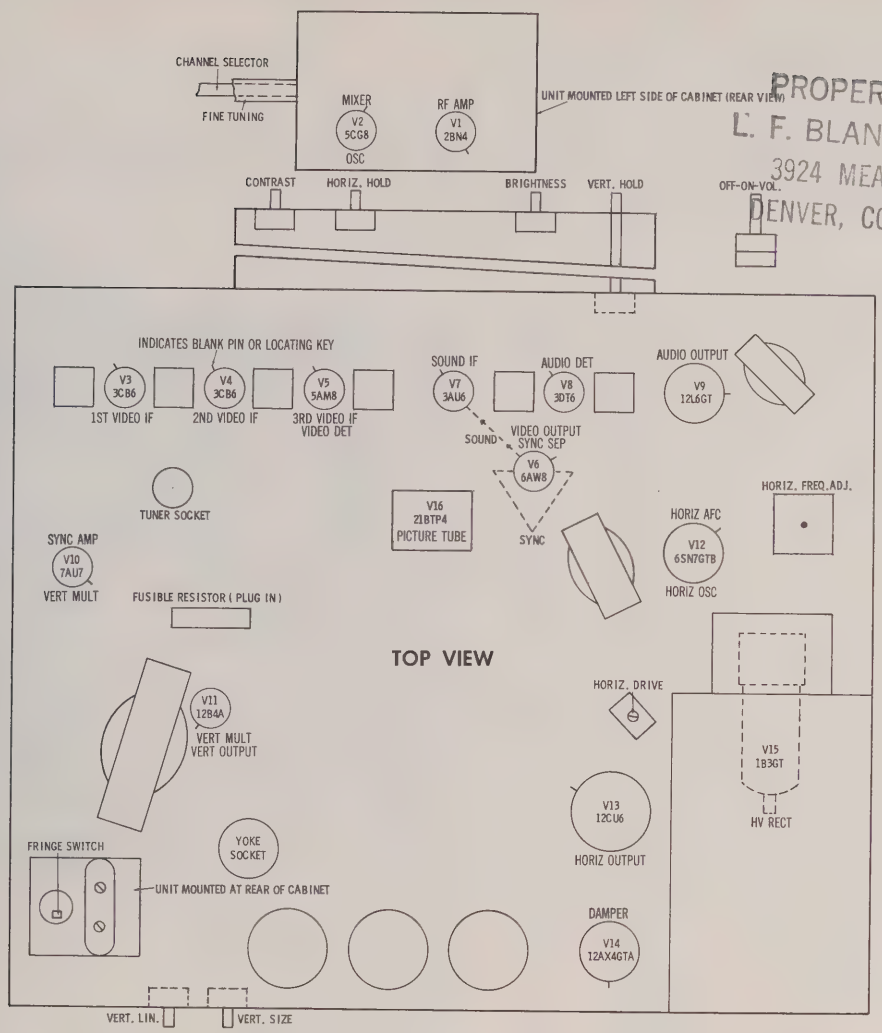
FOLDER 5


RF AMP V1 2BN4
MIXER V2 A 5CG8
OSC V2 B 5CG8
SOUND IF V7 3AU6
AUDIO DET V8 3DT6
AUDIO OUTPUT V9 12L6GT
1ST VIDEO IF V1 3CB6
2ND VIDEO IF V4 3CB6
3RD VIDEO IF V5 A 5AM8
VIDEO DET V5 B 5AM8
VIDEO OUTPUT V10 A 6AW8
SYNC AMP V6 B 6AW8
SYNC SEP V10 A 7AU7
VERT MULT V10 B 7AU7
VERT MULT V11 12B4A
VERT OUTPUT V11 12B4A
HORIZ OSC V12 6SN7GTB
HORIZ WAVE FORM
HORIZ OUTPUT V13 12CU6
HV RECT V15 1B3GT
DAMPER V14 12AX4GTA
PICTURE TUBE V16 21BTP4
ION TRAP
DEFLECTION YOKE
VOLUME 350K
CONTRAST
BRIGHTNESS 250K
VERT HOLD 200K
VERT SIZE 5meg
VERT LINEARITY 2500
HORIZ HOLD 100K
HORIZ AFC
HORIZ FREQ
HORIZ DRIVE
BOOST 560V
FINE TUNING
FRINGE
LOCAL
TEST POINT
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
VHF Tuner Part #TA-35-36
ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATED ON PAGE 11
Tuner Power Plug & Socket
To Pin 8 Of V9 (Audio Output)
To Control Bracket
To Terminal 2 Of Tuner Power Socket
TERMINAL BOARD
HV TRANSFORMER TERMINAL BOARD
12AX4GTA 117VAC 105VAC
12CU6 75VAC
12B4A 63VAC
7AU7 54VAC
3CB6 51VAC
3CB6 48VAC
5AM8 43VAC
3AU6 40VAC
21BTP4 7VAC
6SN7GTB 13VAC
12L6GT 19VAC
6AW8 31VAC
3DT6 37VAC
TAKEN WITH PIX 8 OF VERT. MULT TUBE (V10B) SHORTED TO GROUND, AND VERT. SIZE CONTROL (R91) SET AT CENTER OF ROTATION
DO NOT MEASURE
SEE PARTS LIST FOR ALTERNATE VALUE OF APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
RATIO FIGURES GIVEN WITH CONTROLS
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction (bottom view).
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

TRAV-LER MODELS 721-K-120, U, 721-K-765, U, 721-K-767, U, 721-LP-800, U, 721-MT-110, U, 721-T-111, U, 721-T-760, U, 721-TL-112, U (Ch. 835-17, 836-17, 837-17, 838-17)

TUBE PLACEMENT CHART



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DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

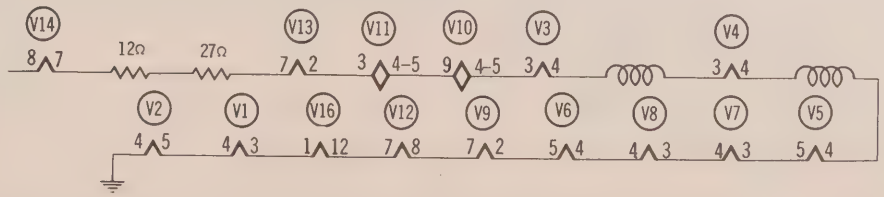
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R100), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V6, V10**
No horiz. sync - **V6, V10, V12**
No vert. or horiz. sync - **V6, V10**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V16**
No vertical deflection - **V10, V11**
Poor vert. linearity or foldover - **V10, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, M1, M2**
Vert. off freq. - **V10, V11**
Horiz. off freq. - **V12**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the mixer-osc. tube (V2), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44MC (10MC Swp)	40.8MC 41.25MC 42.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B) . Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Make adjustments in numerical order. A1 and A3 affect high frequency side of response. A2 and A5 affect the low frequency side. A4 is adjusted to place 41.25MC marker in trap notch. A6 affects the center of bandpass. It may be necessary to retouch A5 to 3-5% amplitude at 40.8MC as in Fig. 1.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	.001MFD	High side to point (B) . Low side to chassis.	4.5MC (400∿ FM Mod)	Not used	Any non-interfering channel	Across secondary of audio output transformer (T4).	A7, A8, A9	Using a high signal level, adjust A7 for maximum 400∿ indication on scope. Proper peak for A7 is where the voltage at point C (measured with a VTVM) will be 4 to 6 volts DC.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.001MFD	High side to point (B) . Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (B) . Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A12	
			201MC	199.25MC 203.75MC	11		A13	
			195MC	193.25MC 197.75MC	10		A14	
			189MC	187.25MC 191.75MC	9		A15	
			183MC	181.25MC 185.75MC	8		A16	
			177MC	175.25MC 179.75MC	7		A17	
			85MC	83.25MC 87.75MC	6		A18	
			79MC	77.25MC 81.75MC	5		A19	
			69MC	67.25MC 71.75MC	4		A20	
			63MC	61.25MC 65.75MC	3		A21	
			57MC	55.25MC 59.75MC	2		A22	

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

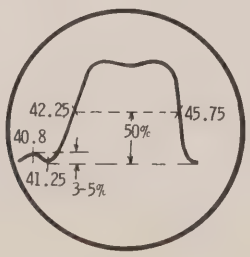


FIG. 1

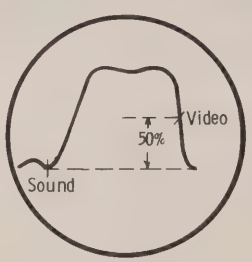


FIG. 2

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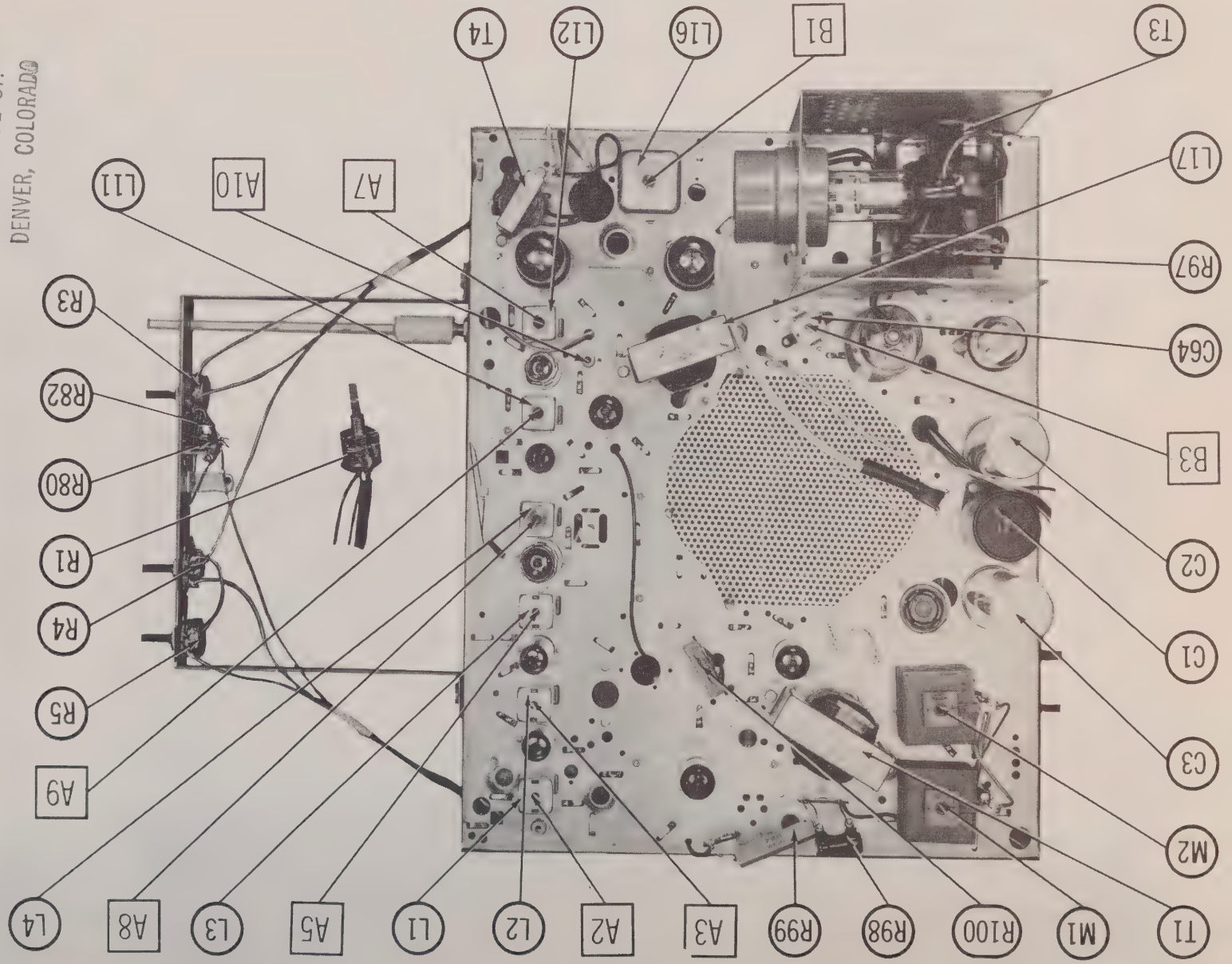
DENVER, COLORADO

CHASSIS TOP VIEW



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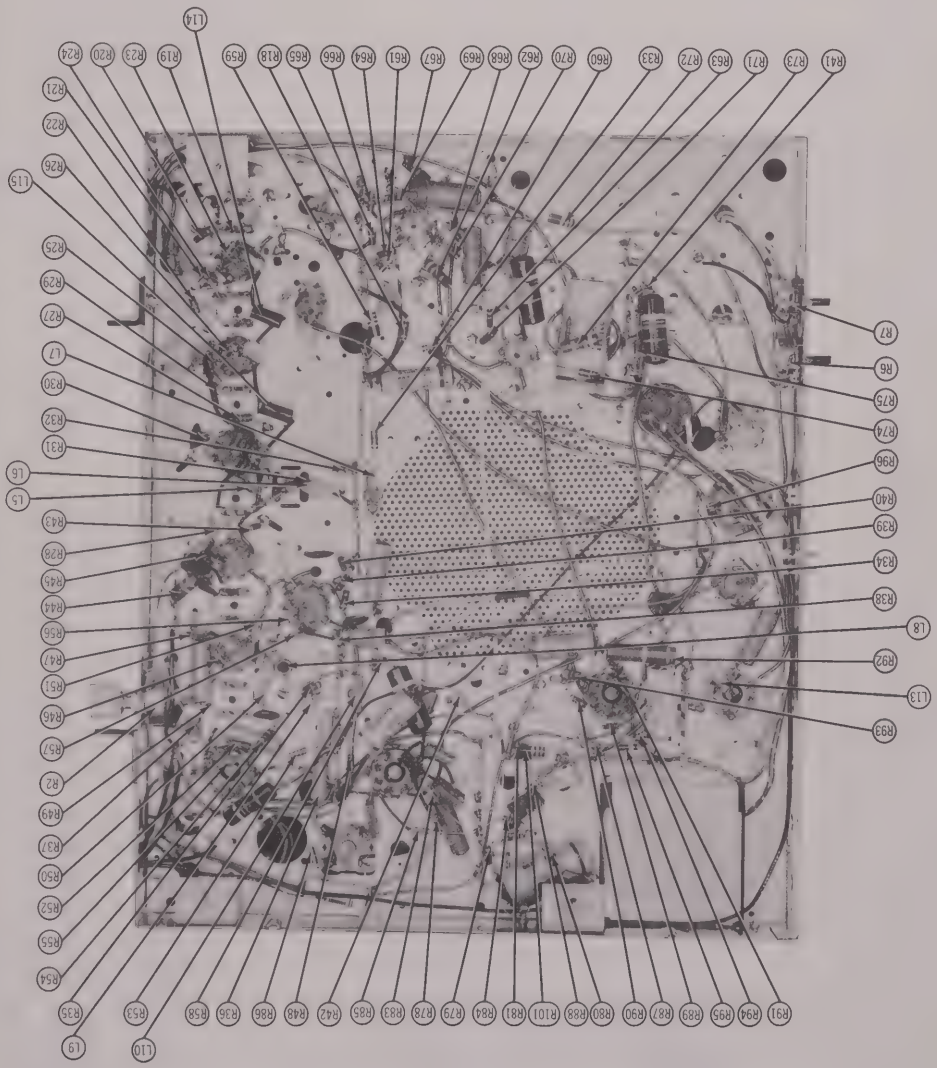
DENVER, COLORADO

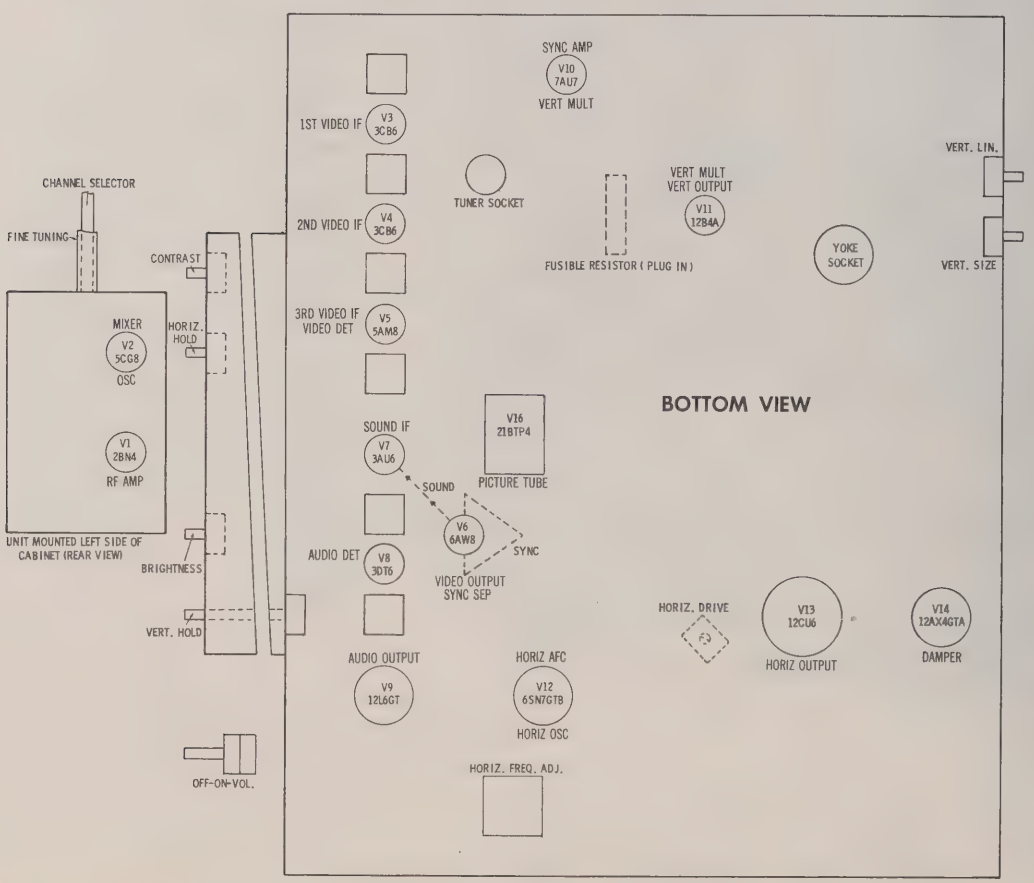
CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	2Meg	1.5Ω	1Ω	▪ 1300Ω	0Ω	1.8Meg		
V2	5CG8	10K	▪ 7100Ω	0Ω	0Ω	1Ω	▪ 330Ω	▪ 10K	0Ω	220K
V3	3CB6	1Meg	47Ω	12.5Ω	11.5Ω	▪ 660Ω	▪ 660Ω	0Ω		
V4	3CB6	1Meg	47Ω	11.5Ω	10.5Ω	▪ 330Ω	▪ 330Ω	0Ω		
V5	5AM8	150Ω	.1Ω	▪ 1000Ω	10.5Ω	9.5Ω	† 3900Ω	.5Ω	4700Ω	0Ω
V6	6AW8	0Ω	2.5Meg	▪ 33K	8.5Ω	7Ω	66Ω	1Meg	▪ 4700Ω	† 5000Ω
V7	3AU6	100K	0Ω	9.5Ω	9Ω	▪ 10K	▪ 10K	120Ω		
V8	3DT6	5.6Ω	680Ω	9Ω	8.5Ω	† 370K	▪ 3900Ω	560K		
V9	12L6GT	TP	7Ω	† 220Ω	† 0Ω	500K	TP	4.5Ω	¶	
V10	7AU7	▪ 6000Ω	500K	0Ω	12.5Ω	12.5Ω	• ‡4Meg	220K	• 230K	13.5Ω
V11	12B4A	• 700Ω	2.2Meg	15.5Ω	13.5Ω	13.5Ω	TP	2.2Meg	TP	† 330Ω
V12	6SN7GTB	480K	† 47K	0Ω	1.5Meg	• † 50K	410K	3Ω	4.5Ω	
V13	12CU6	TP	15.5Ω	NC	† 8300Ω	1Meg	TP	17.5Ω	10Ω	TOP CAP ‡17Ω
V14	12AX4GTA	NC	NC	¶	NC	† 1.2Ω	NC	55Ω	60Ω	
V15	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡482Ω
V16	21BTP4	1.5Ω	22K	PIN 6 ▪ 330Ω	PIN 10 ‡100K	PIN 11 • 180K	PIN 12 3Ω			

† MEASURED FROM 245V SOURCE .
‡ MEASURED FROM PIN 3 OF V14.
▪ MEASURED FROM 135V SOURCE.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

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ALTERNATE TUNER SCHEMATIC

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

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DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	2BN4	
V2	Mixer-Oscillator	5AU8	
V3	Video-IF Amp	3CB6	
V4	2nd Video-IF Amp	3CB6	
V5	3rd Video-IF Amp		
	Video-Det	5AM8	
V6	Video-Output-Sync Sep	6AH8	
V7	Sound-IF Amp	3AL6	

ITEM No	USE	TYPE	NOTES
V8	Audio Detector	3DT6	
V9	Audio Output	12AU6	
V10	Sync Amp -Vert Mult	7AL7	
V11	Vert Mult -Vert Output	12BH4	
V12	Horiz AFC-Horiz Osc	6BN7GTB	
V13	Horiz Output	2A3OR	
V14	Damper	12AX4GTA	
V15	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	TRAV-LER PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	21EP4	21EP4 1	21EP4 2	1 Aquatinted 2 Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP.	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	200	EC-84	AFHH-37-25	XA0386	FP131	T98H-34	S-160	TVL-1540
C2A	40	350	EC-85	AFH4-86-38	DD788.3	FPA30.38		Q-263 *MTD-4610	RSSU *
B	40	150							
C	80	300							
D	30	50							
C3A	40	300	EC-86	AFH3-100-80	CG734	FP336.74	TM7-477	Q-163 *MT-4540	R2292 *
B	40	300							
C	300	150							

* Non-catalog items

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA								NOTES
	CAP.	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C4	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		Note 1
C5	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500 ED-1590	DC5D15 DC5D15	5HK-D15 5HK-D15		10%
C6	280						ED-280				
C7	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C8	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1590	DC5D15	5HK-D15		
C9	470			SI 470	DE-471	LTE747	GP-470	UC-5247	SGA-T47		
C10	1500		CC-79	BPD-0015	DD-153	BYA10D15	ED-1500	DC5D15	5HK-D15		
C11	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C12	560		CC-87								5%
C13	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5		
C14	5000			BPD-005	DD-502	BYA10D5	ED-005	DC535	5HK-D5		
C15	.1	200		P268N-1	DF-104	CUB2P1		GEM-201	2TM-P1		
C16	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C17	8			MPG-81 S	TCZ-4RT	CUV5C	TCO-5	ZT-5R8	*STCC-V5		5%
C18	10			MPG-81 10	TCZ-10	CU6CC	TCO-10	ZT-5AL	*STCC-Q		10%
C19	.047	300		P338N-047	DF-503	CUB3F47		GEM-6147	3TM-S47		
C20	10000			BPD-01	DD-103	BYA5S1	ED-01	DC5I1	5HK-S1		
C21	5000			BPD-005	DD-502	BYA10D5	ED-005	DC535	5HK-D5		
C22	.47		MC-35	1469-000047		22R5Q47			MS-447		5%
C23	30		CC-73								10%
C24	.1	600		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C25	100			SI 100	DE-101	LTE71	GP-100	UC-521	SGA-T1		
C26	10000			BPD-01	DD-103	BYA5S1	ED-01	DC5I1	5HK-S1		
C27	10000			BPD-01	DD-103	BYA5S1	ED-01	DC5I1	5HK-S1		
C28	.02	600		P468N-02	DD-203	CUB5S2	ED-02	GEM-613	6TM-S2		
C29	10000			BPD-01	DD-103	BYA5S1	ED-01	DC5I1	5HK-S1		
C30	10000			BPD-01	DD-103	BYA5S1	ED-01	DC5I1	5HK-S1		
C31	5000			BPD-005	DD-502	BYA10D5	ED-005	DC535	5HK-D5		
C32	1000			SI 1000	DE-102	LTE2X	GP-1000	UC-521	SGA-D1		
C33	100			SI 100	DE-101	LTE71	GP-100	UC-521	SGA-T1		
C34	.0047	600	PC-41	P468N-0047	DE-472	CUB4D47	GP-4700	GEM-6247	6TM-D47		
C35	.01	600	PC-42	P468N-01	DE-103	CUB5E1	GP-10000	GEM-611	6TM-S1		
C36	10000			BPD-01	DD-103	BYA5S1	ED-01	DC5I1	5HK-S1		
C37	.01	400		P468N-01	DE-103	CUB4E1	GP-10000	GEM-411	4TM-S1		
C38	330						ED-330				10%
C39	.022	600	PC-45C	P568N-022	DD-203	CUB6S23	ED-03	GEM-6123	6TM-S22		
C40	3000		CC-88	SI 3000	DE-302	LTE3D	GP-3000	UC-533	SGA-D2		
C41	5000			BPD-005	DD-503	LTE5D	GP-5000	UC-535	SGA-D5		
C42	5000			SI 5000	DE-502	LTE5D	GP-5000	UC-535	SGA-D5		10%
C43	1000		CC-88				GP-1000				
C44	.047	300		P338N-047	DF-503	CUB4F47		GEM-6147	3TM-S47		
C45	.033	600	PC-38C								10%
C46	.01	600	PC-43	P568N-01	DE-103	CUB6E1	GP-10000	GEM-611	6TM-S1		
C47	.1	400	PC-44	P468N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C48	1500		CC-79	BPD-0015	DD-153	BYA10D15	ED-1500	DC5D15	5HK-D15		
C49	1000	1000	CC-77	HVD-15-1000	DD30-102	BY AUC1M	HD45-1000	DC30H	5GA-D1		
C50	.047	600	PC-40C	P568N-047	DE-473	CUB6F47		GEM-6147	6TM-S47		
C51	5000			BPD-005	DD-502	BYA10D5	ED-005	DC535	5HK-D5		
C52	.022	600	PC-45C	P568N-022	DD-203	CUB6S23	ED-03	GEM-6123	6TM-S22		
C53	.047	600	PC-40C	P568N-047	DE-473	CUB6F47		GEM-6147	6TM-S47		
C54	83		MC-25	1469-000083		22R5Q83			MS-483		10%
C55	83		MC-25	1469-000083		22R5Q83			MS-483		10%
C56	.047	300	PC-39								10%
C57	.47	300						GEM-3047			10%
C58	.022	300	PC-43								10%
C59	.047	600	PC-40C								10%
C60	100	600	MC-24	1469-00015		22R5T15			MS-515		5%
C61	.01	600									10%
C62	830		MC-33	1464-00083		1R5T83			MS-383		5%
C63	1000			SI 1000	DE-102	LTE2X	GP-1000	UC-531	SGA-D1		
C64	35- 350		TC-20								
C65	.1	600	PC-44	P468N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C66	470		CC-78								5%
C67	75	3000									10%
C68	.1	600		P468N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C69	.47	600	PC-34	P668N-47		CUB6F47		GEM-6047	6TM-P47		
C70	.022	600	PC-45C	P568N-022	DD-203	CUB6S23	ED-02	GEM-6122	6TM-S22		
C71	.01	600	PC-42	P468N-01	DE-103	CUB6E1	GP-10000	GEM-611	6TM-S1		
C72	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C73	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C74	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C75	1500		CC-79	BPD-0015	DD-152	BYA10D15	ED-1500	DC5D15	5HK-D15		
C76	1500		CC-79	BPD-0015	DD-153	BYA10D15	ED-1500	DC5D15	5HK-D15		

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C77	1500		CC-79	BPD-0015	DD-152	BY A10D15	ED-1500	DC5D15	5HK-D15	
C78	1500		CC-79	BPD-0015	DD-152	BY A10D15	ED 1500	DC5D15	5HK-D15	
C79	1500		CC-79	BPD-0015	DD-153	BY A10D15	ED-1500	DC5D15	5HK-D15	
C80	1500	1500	CC-79	HVD-15-1500	DD30-152	HV C16D15	HD45-1500	DC30D15		

Note 1. Not used in some versions.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESIST OHMS	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	350K		VC-99	B-80-S	A47-300K-S	Q13-133	U48		Volume - Note 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.		
C	Switch			Not Req.	SWS-13	T6-1	Not Req.		
R2	15K		VC-92						Contrast - Tap @ 5000Ω
R2A	100K		VC-93	B-60	A47-100K-S	Q41-138	U41		Horiz. Hold
B	Shaft			Not Req.	RSS-3	Not Req.	Not Req.		
R4A	250K		VC-91	B-80	A47-250K-S	Q41-130	U48		Brightness
B	Shaft			Not Req.	RSS-3	Not Req.	Not Req.		
R5A	200K		VC-94	B-60	A47-200K-S	Q41-129	U43		Vert. Hold
B	Shaft			Not Req.	RSS-3	Not Req.	Not Req.		
R6A	5Meg		VC-90		A47-5Meg-S	Q41-141			Vert. Size
B	Shaft				RN-3	T4			
R7A	25300		VC-89	AS-7	A47-3500-S	Q41-113	PTA252L		Vert. Linearity
B	Shaft			AE-13	RN-3	T4	Not Req.		

Note 1. Alternate part #VC-96 used in Ch. 835-17, 838-17.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	TRAV-LER PART No.	IRC PART No.		
R8	470Ω			BTS-470		
R9	330Ω			BTS-330		
R10	470Ω			BTS-470		
R11	4700Ω			BTS-4700		
R12	10000			BTS-10K		
R13	5900Ω			BTS-5900		
R14	220K			BTS-220K		
R15	10K			BTS-10K		
R16	6800Ω			BTS-6800		
R17	10K			BTS-10K		
R18	1Meg			BTS-1Meg		
R19	47K					
R20	1000Ω			BTS-330		
R21	330K			BTS-330		
R22	330Ω			BTS-330		
R23	47Ω			BTS-47		
R24	10000			BTS-330		
R25	330Ω			BTS-47		
R26	47Ω					
R27	27K			BTS-1Meg		
R28	39000					
R29	1000Ω			BTS-1000		
R30	150Ω			BTS-150		
R31	68000					
R32	4700Ω					
R33	1Meg			BTS-1Meg		
R34	1Meg					
R35	6800Ω					
R36	5000Ω	5%	WR-33			
R37	2200Ω					
R38	4700Ω			BTS-4700		
R39	33Ω			BTS-33		
R40	22Ω			BTS-33		
R41	22K			BTS-22K		
R42	120K					
R43	100K			BTS-100K		
R44	10K	2		BTS-10K		
R45	120Ω			BTS-120		
R46	1000Ω			BTS-1000		
R47	1000Ω			BTS-1000		
R48	22K			BTS-22K		
R49	560K			BTS-560K		
R50	39000	1		BTS-3900		
R51	680Ω			BTS-680		
R52	1000Ω			BTS-1000		
R53	1.1Meg	5%	IR-180	BTS-1.1Meg		
				5%		

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRAV-LER PART No.	IRC PART No.	
R54	15Meg			BTS-15Meg	
R55	5.6Meg		IR-164	BTS-5.6Meg	
R56	270K			BTS-270K	
R57	2.2Meg			BTS-2.2Meg	
R58	15K			BTS-15K	
R59	47K	1		BTA-47K	
R60	27K			BTS-27K	
R61	470K			BTS-470K	
R62	47000	1		BTA-4700	
R63	1000Ω			BTS-1000	
R64	22K			BTS-22K	
R65	8200Ω			BTS-8200	
R66	8200Ω			BTS-8200	
R67	220K	1		BTA-220K	
R68	100K			BTS-100K	
R69	1Meg			BTS-1Meg	
R70	150K			BTS-150K	
R71	3.3Meg			BTS-3.3Meg	
R72	47K	1		BTA-47K	
R73	4700	1		BTA-4700	
R74	15K			BTS-15K	
R75	1200Ω				
R76	560Ω				
R77	560Ω				
R78	330K				
R79	820K				
R80	3900Ω				
R81	22K				
R82	68K				
R83	82K				
R84	330K				
R85	150K				
R86	5600Ω				
R87	270K				
R88	330K				
R89	100Ω			BTS-100	
R90	1Meg			BTS-1Meg	
R91	10Ω			BTS-100	
R92	68K			BTS-68K	
R93	6300Ω	2		BTS-6300	
R94	68K			BTS-68K	
R95	100K			BTS-100K	
R96	470K			BTS-470	
R97	4700Ω	1			
R98	1M	7	WR-34		
R99	2Ω	10	WR-36		
R100	7.5Ω			FR-7.5	
R101	47K	1		BTA-47K	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA						NOTES
		TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Output	TR-36	Z1300①	A-2823	V-307	A-8144	26S72	A-10BX	
T2A	Yoke-Horiz. (21M3K)	L-118	DF907	MDF-02	YW0F15/43	DF-8A	Y-18	Y-41 &	
B	(90°)-Vert. (40M3K)		②③	②③	②③	②③	③③	NW3 ③	
M6	Rear Cover and Center Device	MP-77							
	Yoke Clamp	ST-35							
T3	Horiz. Output	TR-37							

① Use 8 to 1 turns ratio.
② Use original horizontal damping network, if necessary.
③ Use original rear cover and centering device. Connect same as original.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI	SEC	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Triad PART No.	
T4	2300Ω	3-4Ω	AT-33	Z1101	A-3025	A-3332	S-12X

SPEAKER

ITEM No	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	SPK-38 ①	5A07	① Used in Model 721T760
	8" X 8"	PM		SPK-48 ②		② Used in Models 721K765, 721K767

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA				NOTES
		TRAV-LER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st. Video IF	L-103	17-5004	TV-126	6334	
L2	2nd. Video IF	L-103				Includes trap
L3	3rd. Video IF	L-104	17-5004	TV-126	6334	
L4A	4th. Video IF	L-108				
B	1st. Sound IF					
L5	RF Choke	L-117	19-1004	BC-565	6820	7.4 Microhenries
L6	Series Peaking Coil	L-107	19-3100	TV-108	6183	113 Microhenries
L7	Shunt Peaking Coil	L-108	19-3500	TV-304	6174	510 Microhenries
L8	4.5MC Trap	L-114	17-3400 *	TV-119 * a	1469 *	
L9	Series Peaking Coil	L-109	19-3250	TV-105		333 Microhenries
L10	Shunt Peaking Coil	L-108	19-3500	TV-304	6174	510 Microhenries
L11	2nd. Sound IF	L-108	17-3496	TV-113	6303	
L12	Quadrature Coil	L-110			1481	Includes resistor and cap.
L13	R-F Choke	L-116	19-1001	BC-563	4804	1.8 Microhenries, IRC part #CLA
L14	Fil. Choke	L-115	19-1001	BC-562	4804	1.7 Microhenries
L15	Fil. Choke	L-115	19-1001	BC-562	4804	1.7 Microhenries

* Disconnect C23. a Disregard tap. @ Parallel 180K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI	SEC	TRAV-LER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Rom PART No.	Thordarson PART No.	
L16	725 *		L-119	20-1405 ①	TV-182 ①	6183 ①	305R1 ①	R-100 ①	RS-8	Waveform Coil 4804

* Tapped @ 50Ω ① Reverse coil mounting in can

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE IO CURRENT (1000 ^/s)	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L17	.250A	54Ω	L 58H	FC-8	CS030 ①	C-2974	C-2325 ①	28C43	C-32X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRAV-LER PART No.	REPLACEMENT DATA
K1	Antenna Isolation	470MMF — .3-1Meg	CC-85	Centralab RC-471
K2	Antenna Isolation	470MMF — .3-1Meg	CC-85	Centralab RC-471

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CURRENT (Measured)	TRAV-LER PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.		
M1	.36DA	SR-6 ①	1090A ①	1N1007 ②	MR300 ①	300 ①	① Selenium Type	
M2	.24D	SR-5 ①	1090A ①	1N1007 ②	MR300 ①	300 ①	② Germanium Type	

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M3	Tuner	TA-36	VHF Chassis 835-17, 838-17
	Tuner	TA-35	VHF Chassis 837-17, 836-17
	Tuner	TA-37	UHF-VHF Chassis 837-17, 838-17
	Tuner	TA-38	UHF-VHF Chassis 837-17, 838-17
M4	Switch	SW-34	Fringe (Slide Type DPST)
M5	Centering Device	MP-77	Includes Yoke Cover
M6	Ion Trap	MA-10	

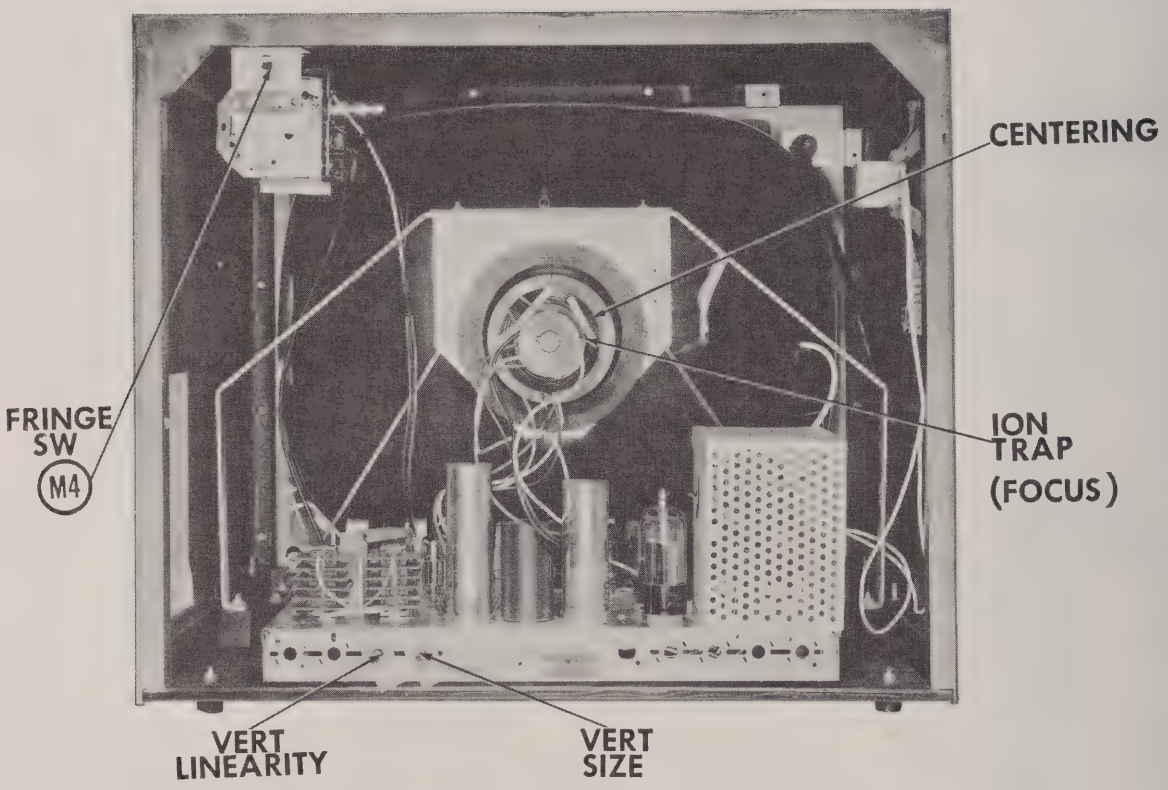
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	DW-71T	
Mask	MP-87	
Knob	K-194	Channel Selector
Knob	K-231	Fine Tuning
Knob	K-233	On-Off-Volume
Knob	K-320	Control (4 used)

TRAV-LER MODELS 721-K-120, U, 721-K-765, U, 721-K-767, U, 721-LP-800, U, 721-MT-110, U, 721-T-760, U, 721-TL-112, U (Ch. 835-17, 836-17, 837-17, 838-17)

FOLDER 5



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust for a normal picture and sound. Set the horizontal hold control to the center of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Connect the vertical amplifier of the oscilloscope thru a 10MMF capacitor to terminal #2 of the horizontal frequency coil (L16). Low side to chassis.

Adjust the horizontal wave shaping slug (B2) for waveform similar to Fig. 3 with the broad peak and narrow peak of equal height. While making the adjustment, keep the picture in sync horizontally with B1.

Turn the horizontal drive trimmer (B3) counter clockwise until a bright vertical line appears in the picture, then turn B3 clockwise until the line disappears and there is no horizontal compression near the center of the screen.

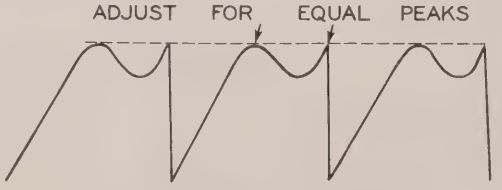
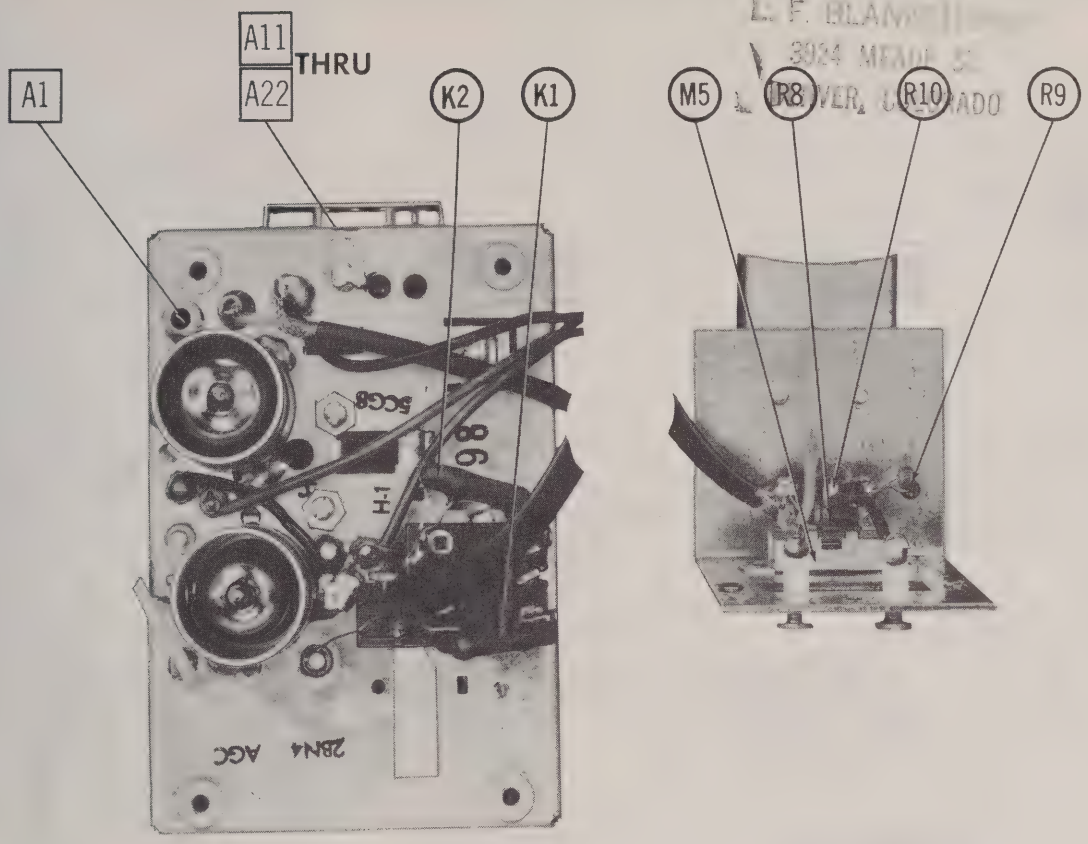
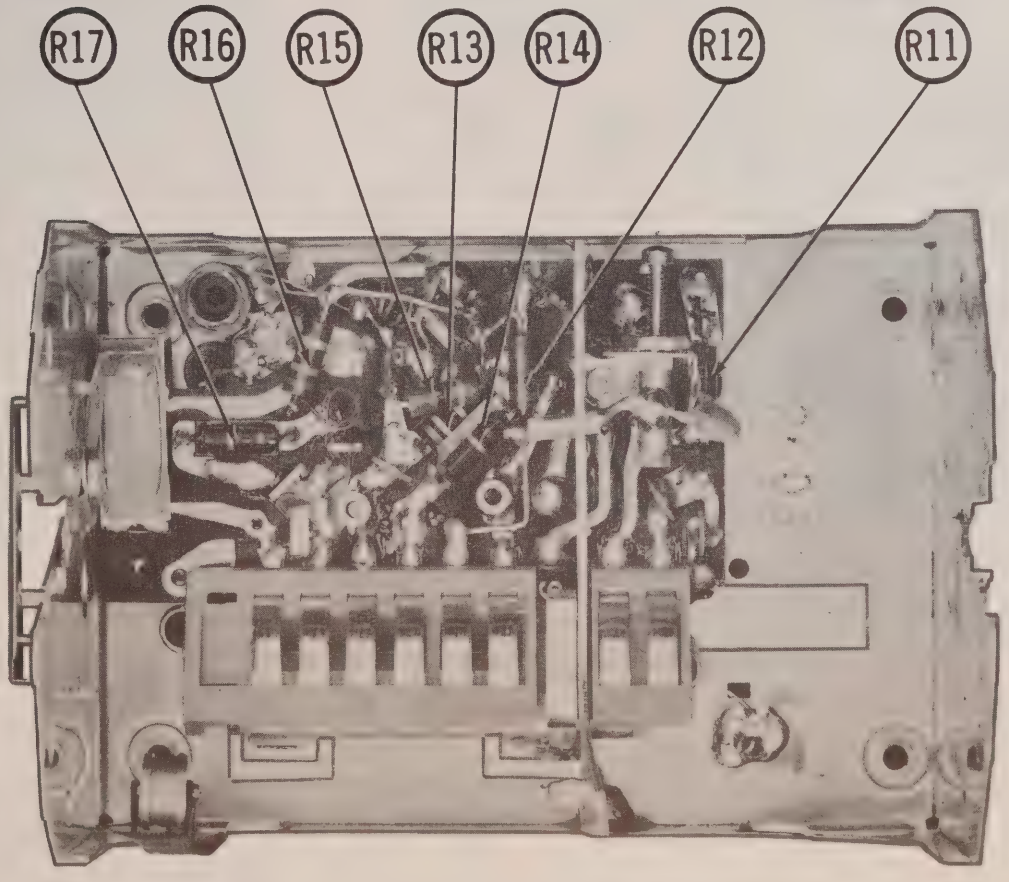


FIG. 3

PROPERTY OF
L. F. BLAN
3934 MEADE ST
DENVER, COLORADO



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

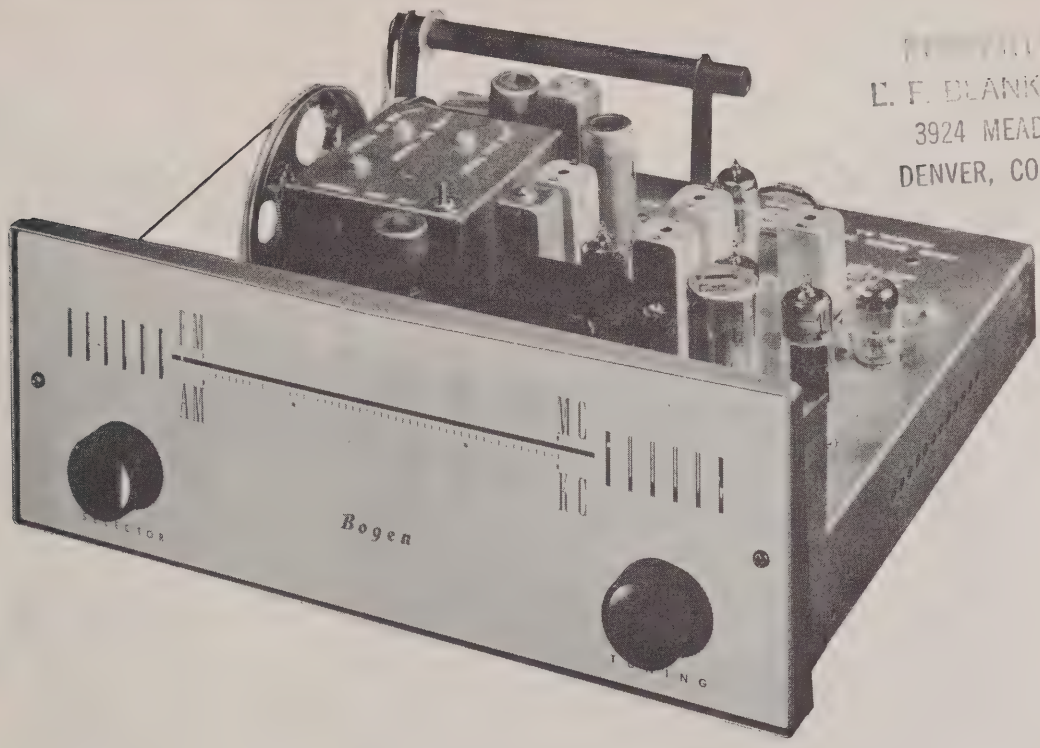
PHOTOFACT* Folder

*TRADE MARK

DAVID BOGEN MODEL R620

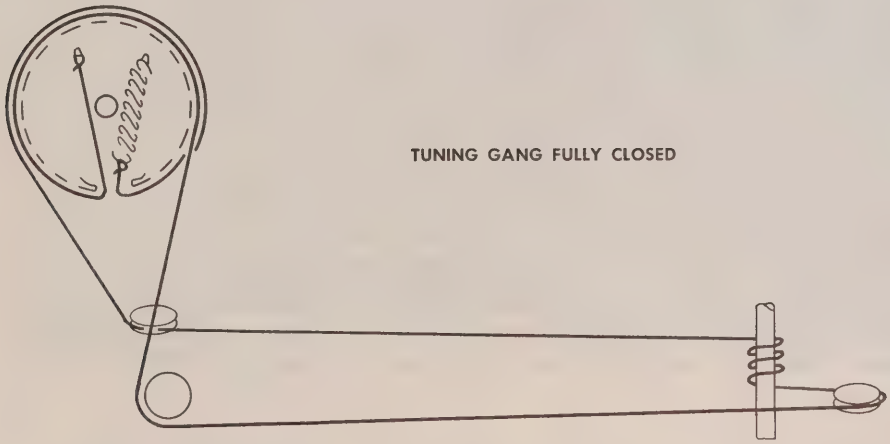
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODEL R620



DAVID BOGEN
MODEL R620

TRADE NAME	David Bogen Model R620
MANUFACTURER	David Bogen Co., Inc., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated FM-AM Tuner
TUBES (Eight)	Types 6AB4 FM RF Amplifier, 6AB4 FM Converter, 6BE6 AM Converter, 6BA6 1st FM-AM IF Amplifier, 6AU6 2nd FM IF Amp.-AM Det., 6AL5 Ratio Detector, 6C4 AF Amplifier, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .27 Amp. @ 117 Volts AC (27 Watts)



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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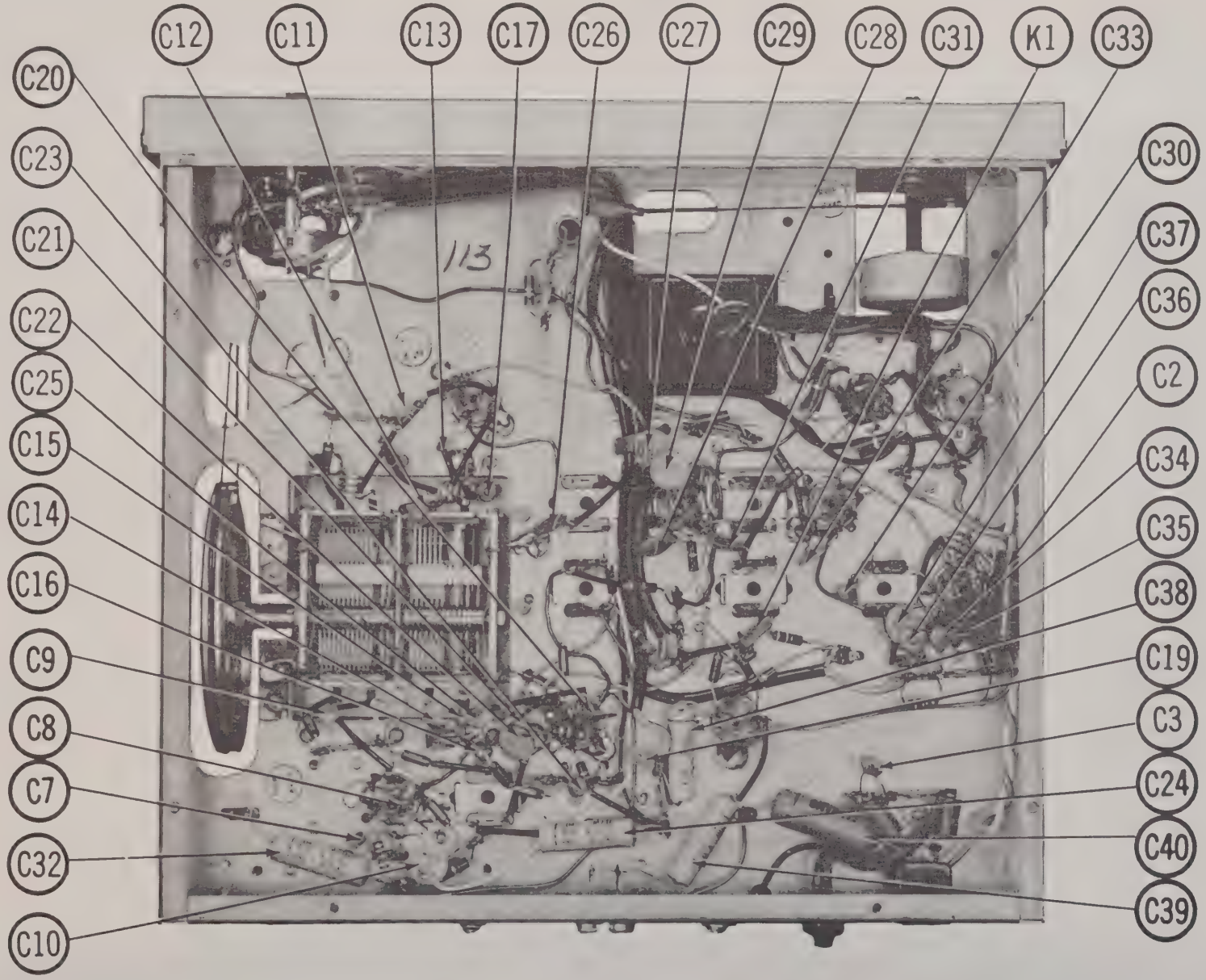
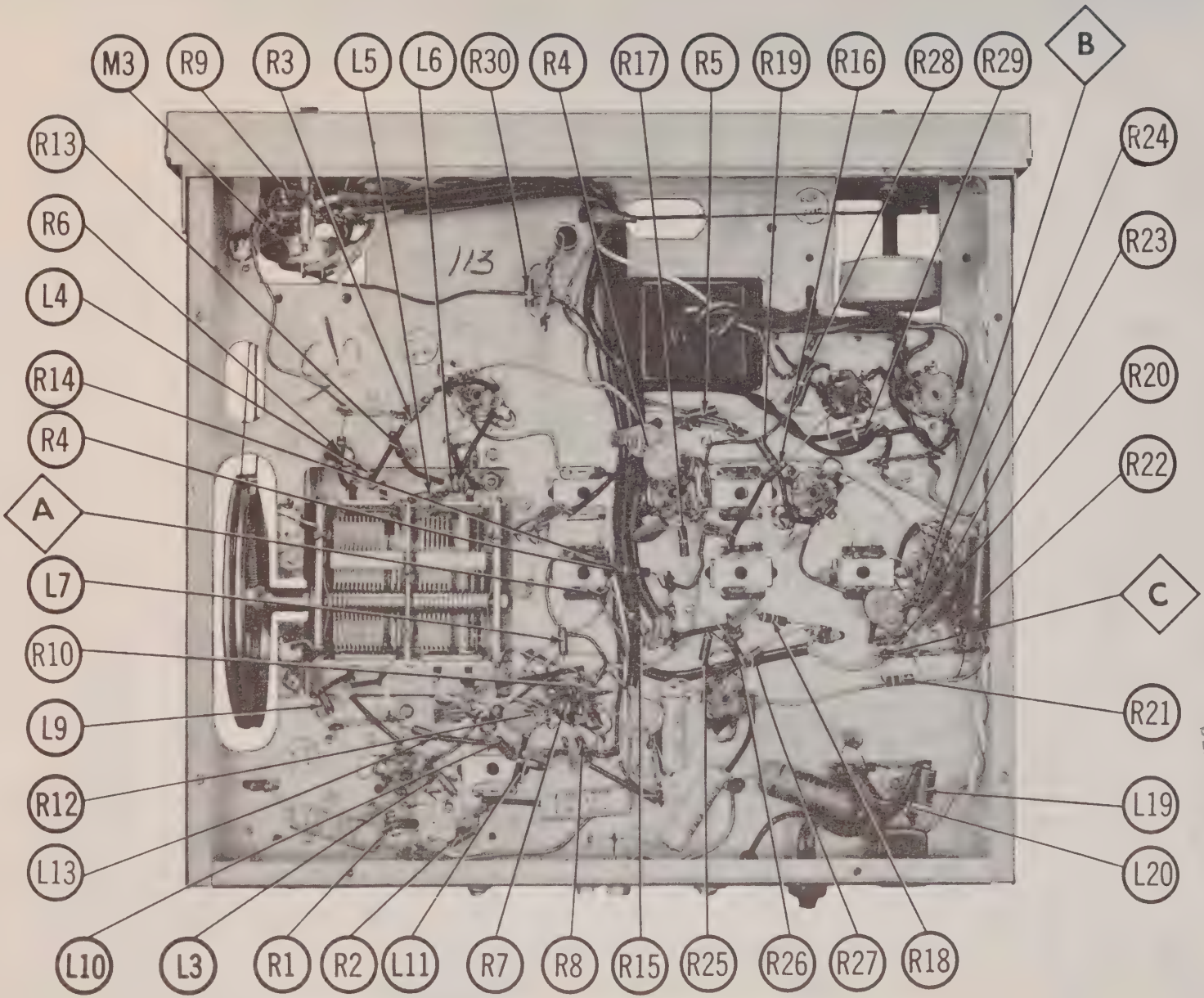


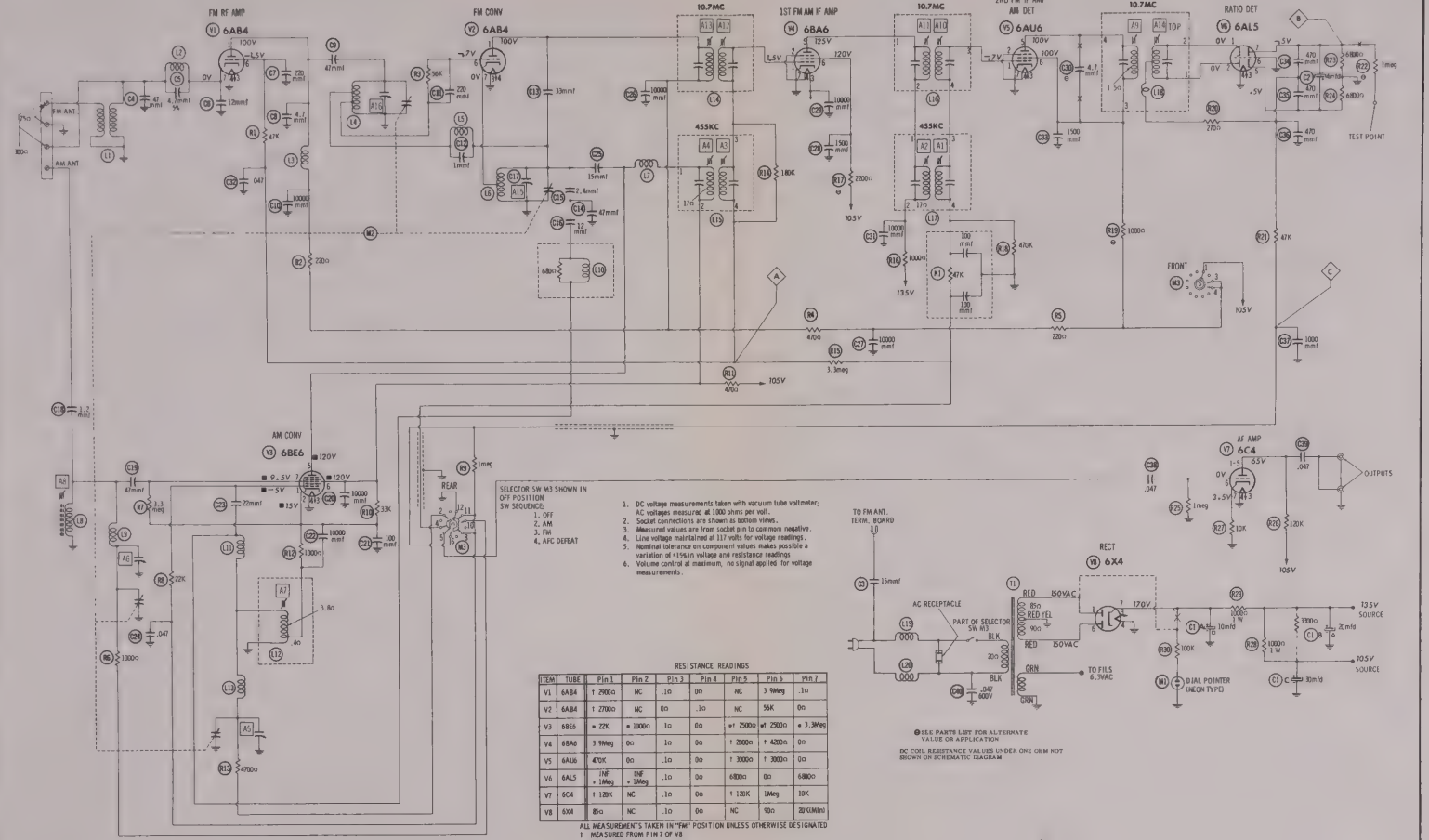
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

DAVID BOGEN
MODEL R620



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6AB4	† 2900Ω	NC	.1Ω	0Ω	NC	3 9Meg	.1Ω
V2	6AB4	† 2700Ω	NC	0Ω	.1Ω	NC	56K	0Ω
V3	6BE6	⊕ 22K	⊕ 1000Ω	.1Ω	0Ω	⊕† 2500Ω	⊕† 2500Ω	⊕ 3.3Meg
V4	6BA6	3 9Meg	0Ω	1Ω	0Ω	† 2800Ω	† 4200Ω	0Ω
V5	6AU6	470K	0Ω	.1Ω	0Ω	† 3000Ω	† 3000Ω	0Ω
V6	6AL5	1Meg ⊕ 1Meg	1Meg ⊕ 1Meg	.1Ω	0Ω	6800Ω	0Ω	6800Ω
V7	6C4	† 120K	NC	.1Ω	0Ω	† 120K	1Meg	10K
V8	6X4	85Ω	NC	.1Ω	0Ω	NC	90Ω	20K(Min)

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 7 OF V8
⊕ MEASURED IN "AM" POSITION
* MEASURED IN "AFC DEFEAT" POSITION
NC NO CONNECTION

⊕SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

380-6

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Align FM Section with Selector in AFC Out position.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400~ Mod)	AM	Tuning gang fully open	DC probe thru 100K to point (A). Common to chassis	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	High side to AM Antenna Terminal. Low side to chassis.	1500KC	"	Tune to 1500KC signal	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7, A8	Adjust for maximum deflection. Repeat steps 2 & 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference	DC probe thru 100K to point (B). Common to chassis	A9, A10, A11, A12 A13	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 100K to point (C). Common to chassis	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Common to chassis	10.7MC (450KC Swp)	FM	Point of non-interference	Vert Amp. thru 100K to point (B). Low side to chassis.	A9, A10, A11, A12, A13	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert Amp. thru 100K to point (C). Low side to chassis.	A14	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Fig. 3	Thru dummy to Antenna Terminals.	106MC	FM	106MC	DC probe thru 100KC to point (B). Common to chassis	A15, A16	Adjust for maximum deflection.
7.	"	"	90MC	"	90MC	"		Check for tracking. Repeat steps 6 & 7.

FIG. 1

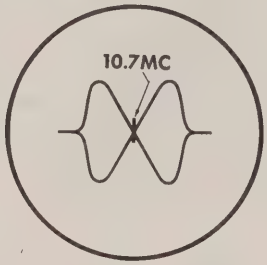


FIG. 2

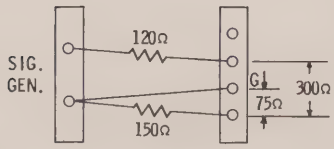
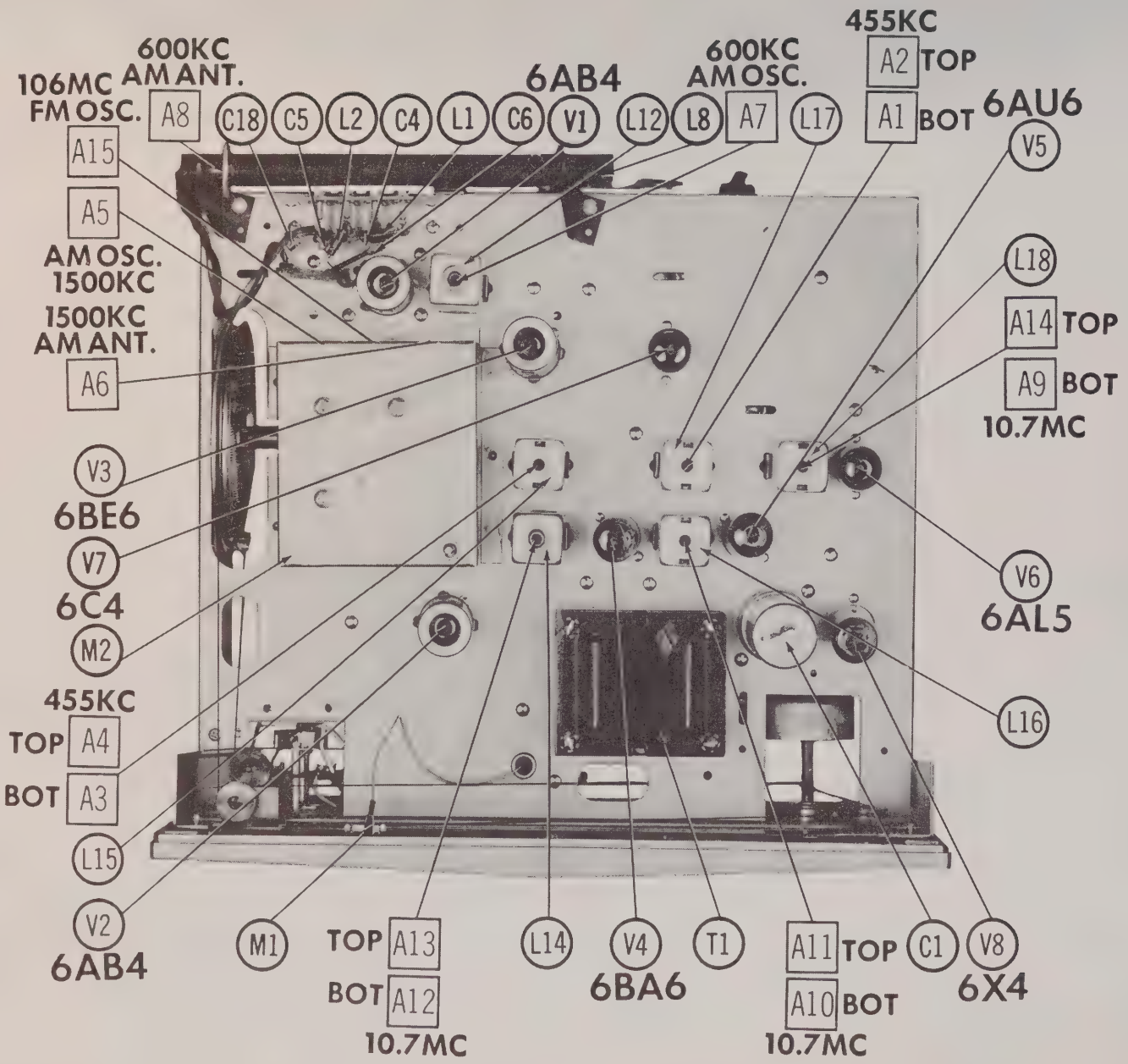


FIG.3



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6AB4	
V2	FM Converter	6AB4	
V3	AM Converter	6BE6	
V4	1st FM-AM IF Amp.	6BA6	
V5	2nd FM IF Amp. - AM Det.	6AU6	
V6	Ratio Detector	6AL5	
V7	AF Amplifier	6C4	
V8	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■10	250		AFH3-18	CO140	FP231. 3	TMT-18	T-080	TVL-3537
B	▲20	200				TC47			
C	30	150							
C2	4	15		SRE25V5	BBR4-50	TC30	TD-4-25	MT-0504	TVA-1303

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	15			BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	
C4	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C5	4. 7			NP0-SI 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	5%
C6	12			SI 12	DD-120	L10Q12	ED-12	UC-5412	5GA-Q12	
C7	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C8	4. 7			NP0-SI 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	
C9	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C10	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C12	1. 0			NP0-SI 1. 0	TCZ-1		TCO-1		5TCCB-V1	
C13	33			BPD-000033	DD-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C14	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C15	2. 4									
C16	12			SI 12	DD-120	L10Q12	ED-12	UC-5412	5GA-Q12	
C17										
C18	1. 2									
C19	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C20	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C21	100			BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C22	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	22			BPD-000022	DD-220	L10Q22	ED-22	UC-5422	5GA-Q22	
C24	. 047	200		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C25	15			BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	
C26	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C27	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C28	1500			BPD-0015	DD-152	BYA10D15	ED-0015	UC-5215	5HK-D15	
C29	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C30	4. 7			NP0-SI 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	①
C31	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C32	. 047	200		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C33	1500			BPD-0015	DD-152	BYA10D15	ED-0015	UC-5215	5HK-D15	
C34	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C35	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C36	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C37	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C38	. 047	200		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C39	. 047	200		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C40	. 047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	

① Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R1	47K			BTS-47K	
R2	220Ω			BTS-220	
R3	56K			BTS-56K	
R4	470Ω			BTS-470	
R5	220Ω			BTS-220	
R6	1000Ω			BTS-1000	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R7	3. 3Meg			BTS-3. 3Meg	
R8	22K			BTS-22K	
R9	1Meg			BTS-1Meg	
R10	33K			BTS-33K	
R11	470Ω			BTS-470	
R12	1000Ω			BTS-1000	
R13	4700Ω			BTS-4700	
R14	180K			BTS-180K	
R15	3. 3Meg			BTS-3. 3Meg	
R16	1000Ω			BTS-1000	
R17	2200Ω			BTS-2200	Note 1
R18	470K			BTS-470K	
R19	1000Ω			BTS-1000	Note 2
R20	270Ω			BTS-270	
R21	47K			BTS-47K	
R22	1Meg			BTS-1Meg	Note 3
R23	6800Ω			BTS-6800	
R24	6800Ω			BTS-6800	
R25	1Meg			BTS-1Meg	
R26	120K			BTS-120K	
R27	10K			BTS-10K	
R28	1000Ω	1		BTA-1000	
R29	1000Ω	1		BTA-1000	
R30	100K			BTS-100K	

Note 1. Some versions may use 470Ω in this application.
Note 2. Some versions may use 220Ω in this application.
Note 3. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .270A	300VCT @ .034A	6. 3VAC @ 2. 75A		T375-1B				22R38	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans	U452				
L2	FM Ant. Coupling Coil	U451	19-1000	BC-561	4602	1 Microhenry
L3	RF Choke	U420	19-1001	BC-562	4604	1. 7 Microhenry
L4	FM RF Coil	U449				
L5	RF Choke	U420	19-1001	BC-562	4604	1. 7 Microhenry
L6	FM Osc. Coil	U450A				
L7	RF Choke	U420	19-1001	BC-562	4604	1. 7 Microhenry
L8	Loop Stick	H452A				
L9	RF Choke	U420	19-1001	BC-562	4604	1. 7 Microhenry
L10	RF Choke	U439	19-1001 *	BC-562 *	4604 *	1. 6 Microhenry; wound on 680Ω Resistor
L11	RF Choke	U420	19-1001	BC-562	4604	1. 7 Microhenry
L12	AM Osc. Coil	U454				
L13	RF Choke	U420	19-1001	BC-562	4604	1. 7 Microhenry
L14	1st FM IF	H458	16-3487	FM-254	1463	
L15	1st AM IF	H297	16-6758	BC-352	12-C1	
L16	2nd FM IF	H355	16-3487	FM-254	1463	
L17	2nd AM IF	H297	16-6758	BC-353	12-C2	
L18	Ratio Det.	H387	17-3498	FM-255	1465	
L19	Line Choke	U503				2 Microhenries
L20	Line Choke	U503				2 Microhenries

* Parallel with 680Ω Resistor

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	David Bogen PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100MMF, 100MMF, 47K		Aerovox PA-97-1 Centralab PC-50 Cornell-Dubilier 111TM1 Erie 1403-01 Sprague D-1

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Dial Pointer		Neon Bulb
M2	Tuning Cap	C638	4 Gang (AM Sections: Ant. 25-535MMF, Osc. 23-195MMF)
M3	Switch	S478	Selector (Rotary Wafer Type)

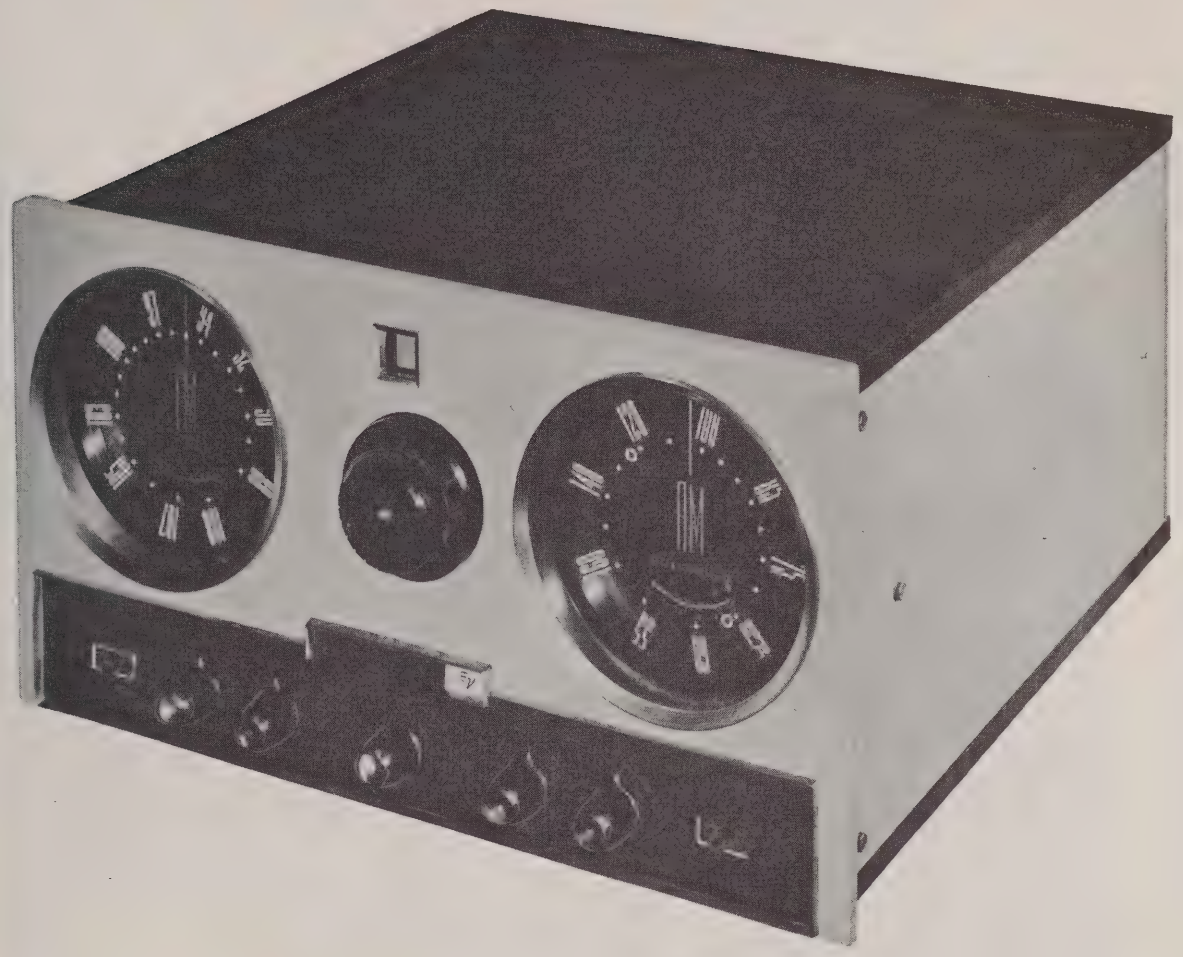
PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

ELECTRO-VOICE MODEL 3303

ELECTRO-VOICE MODEL 3303



ELECTRO-VOICE MODEL 3303

TRADE NAME	Electro-Voice Model 3303		
MANUFACTURER	Electro-Voice, Inc., Buchanan, Michigan		
TYPE SET	AC Operated FM-AM Tuner		
TUBES	Nineteen		
POWER SUPPLY	105-125 Volts AC - 60 Cycles	RATING	.93 Amp. @ 117 Volts AC (100 Watts)
TUNING RANGE—BROADCAST	550KC - 1600KC	FREQ. MOD.	88MC - 108MC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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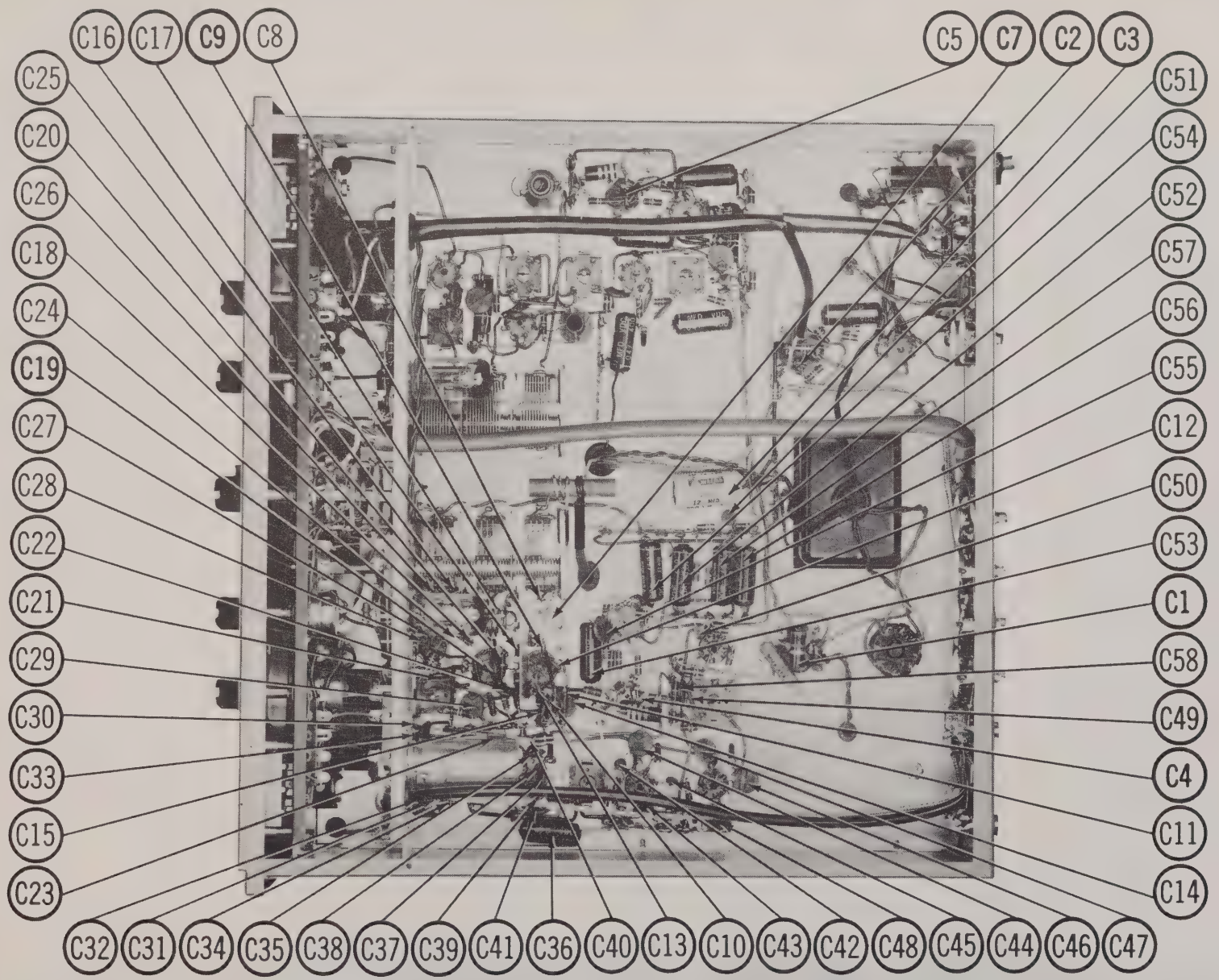
H195

DATE 12-57 SET 380 FOLDER 7

FOLDER 7

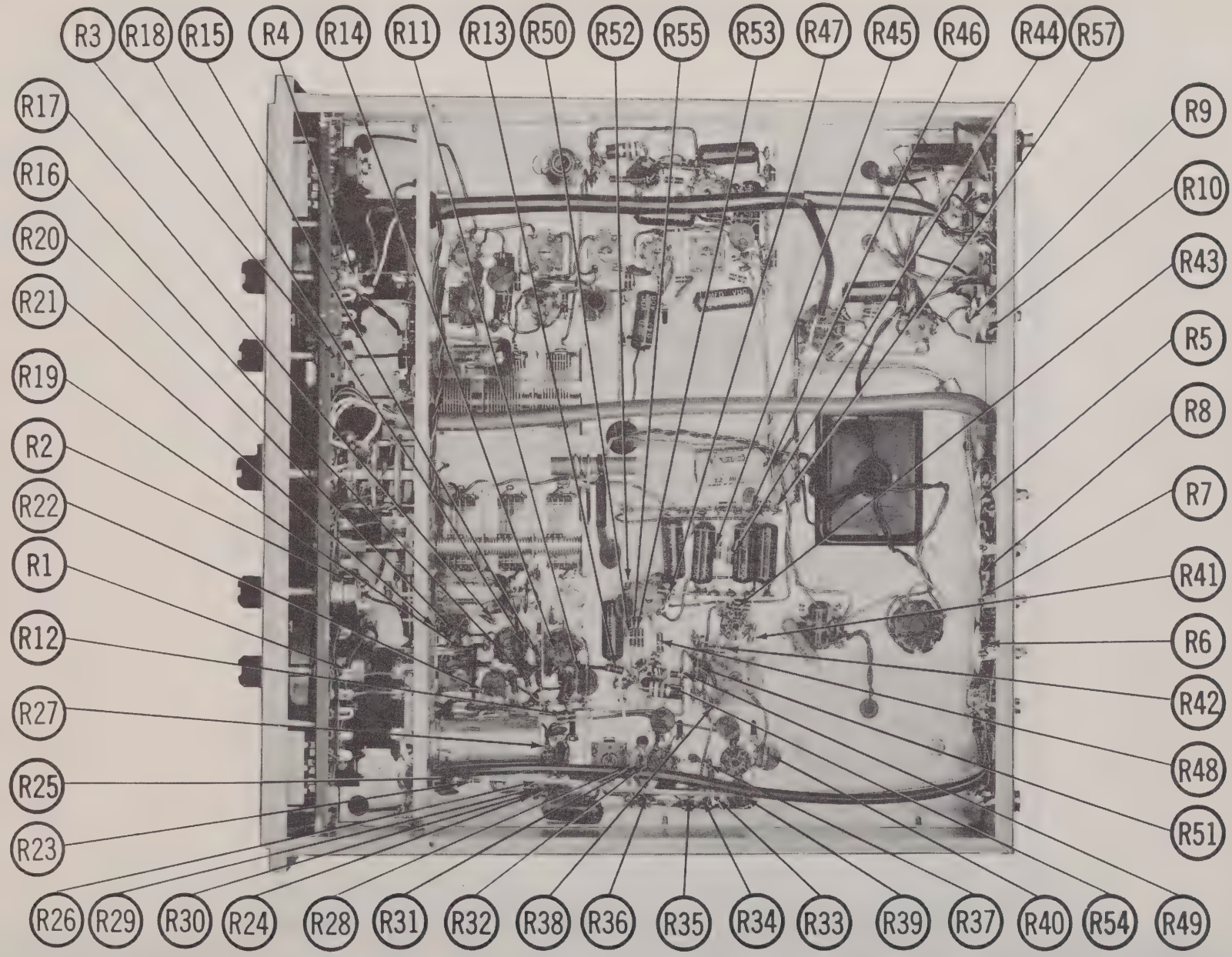


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

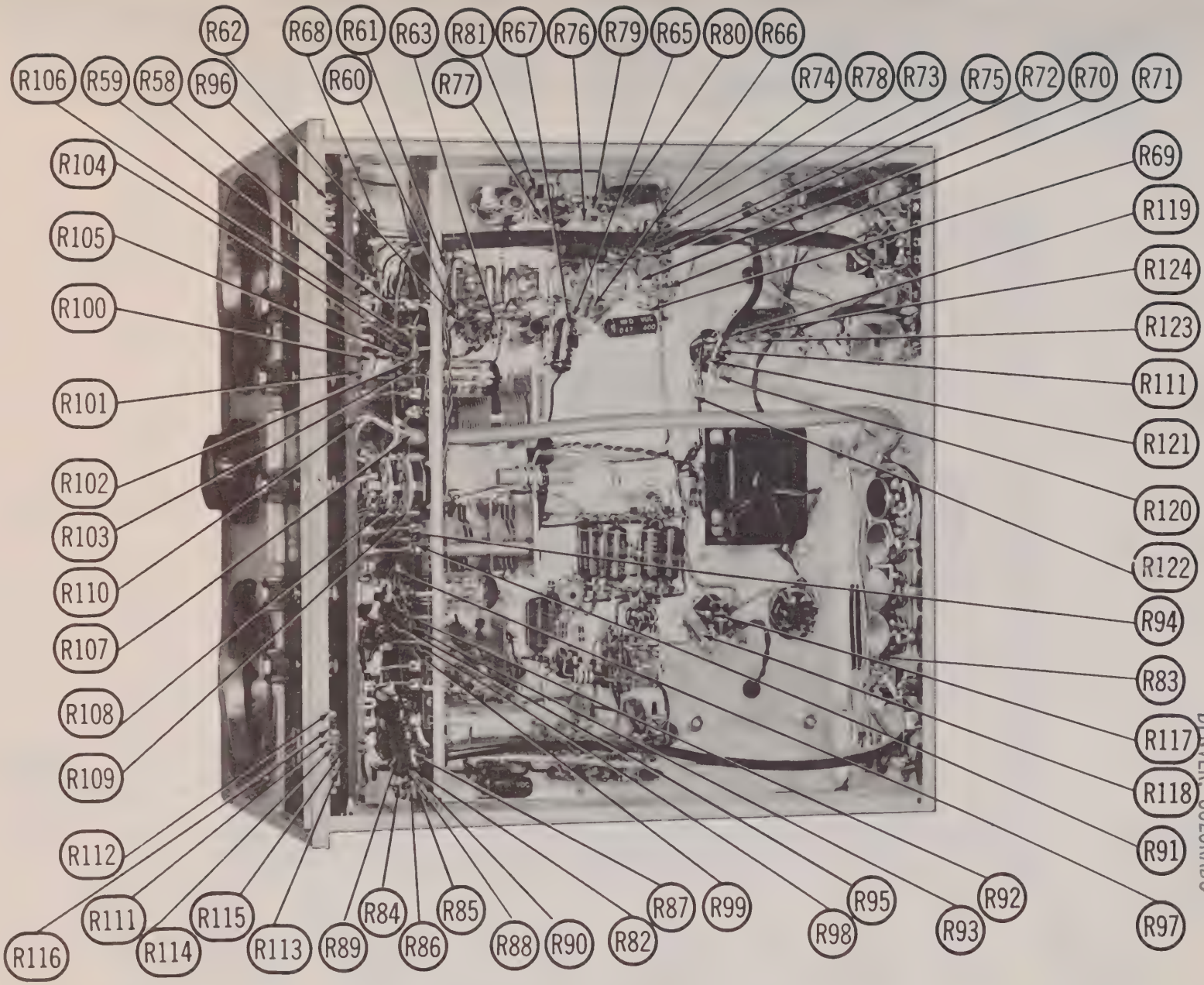
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

ELECTRO-VOICE
MODEL 3303

FOLDER 7

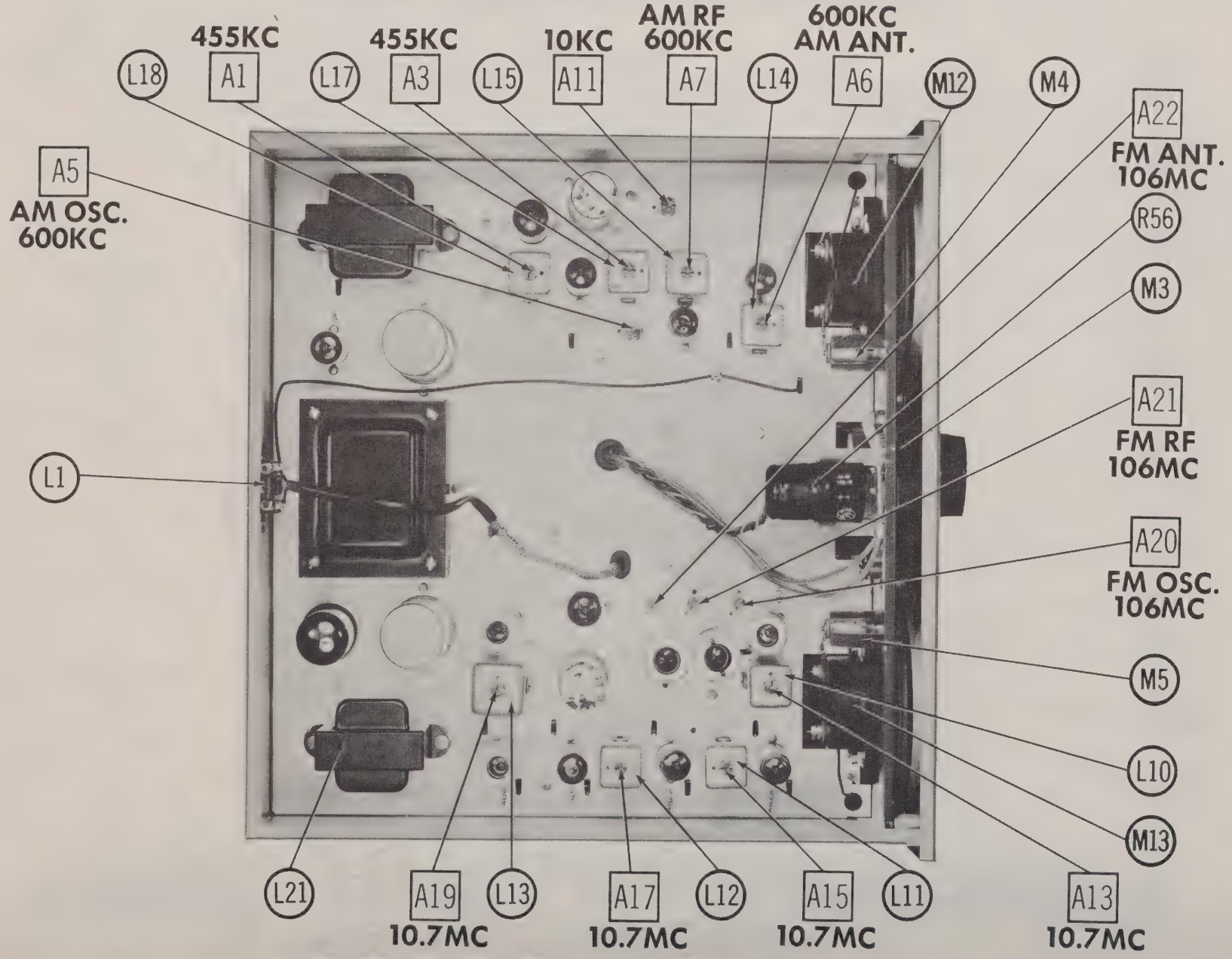


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

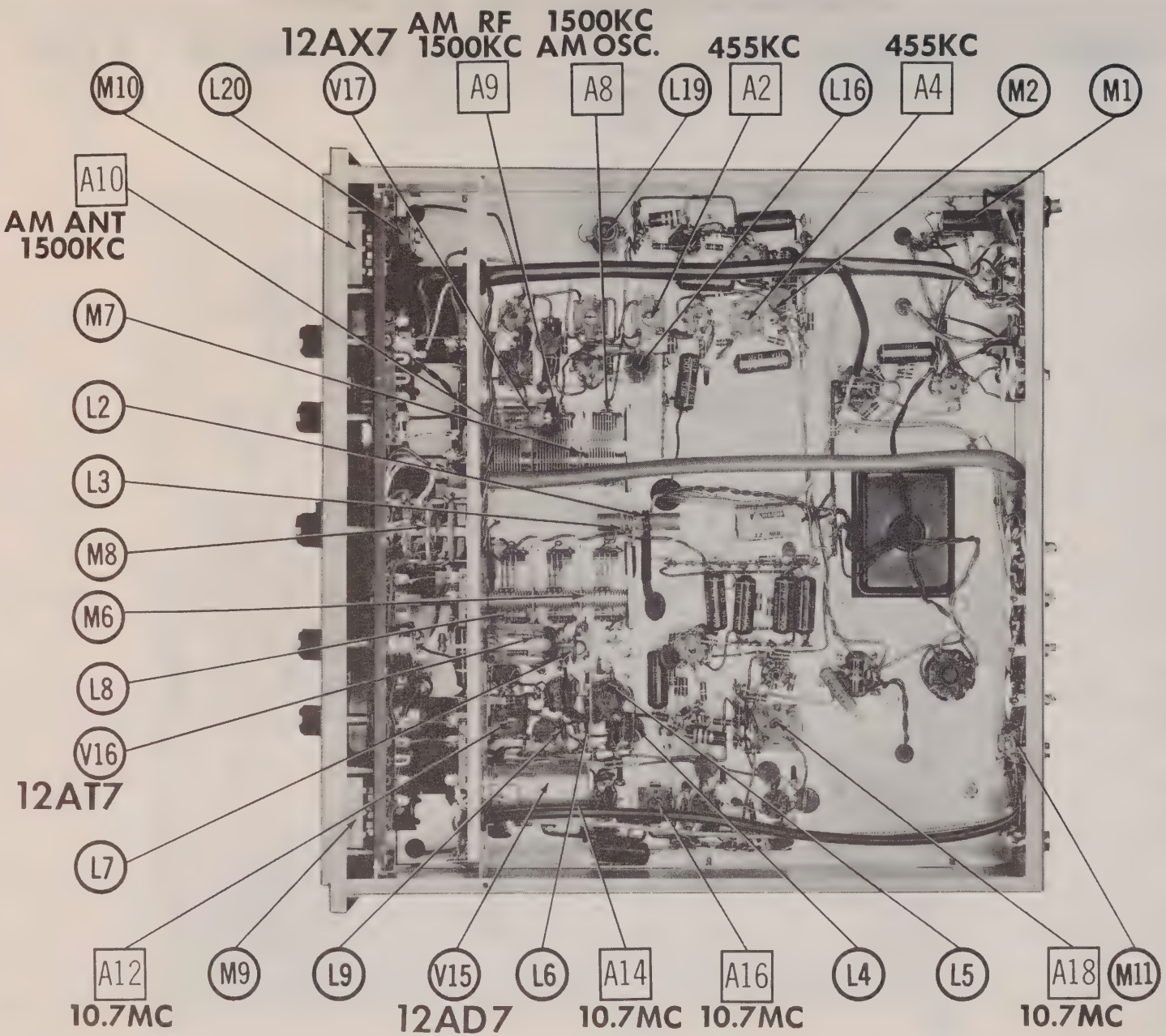


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

L. F. [illegible]
3924 MEADE St.
DENVER, COLORADO

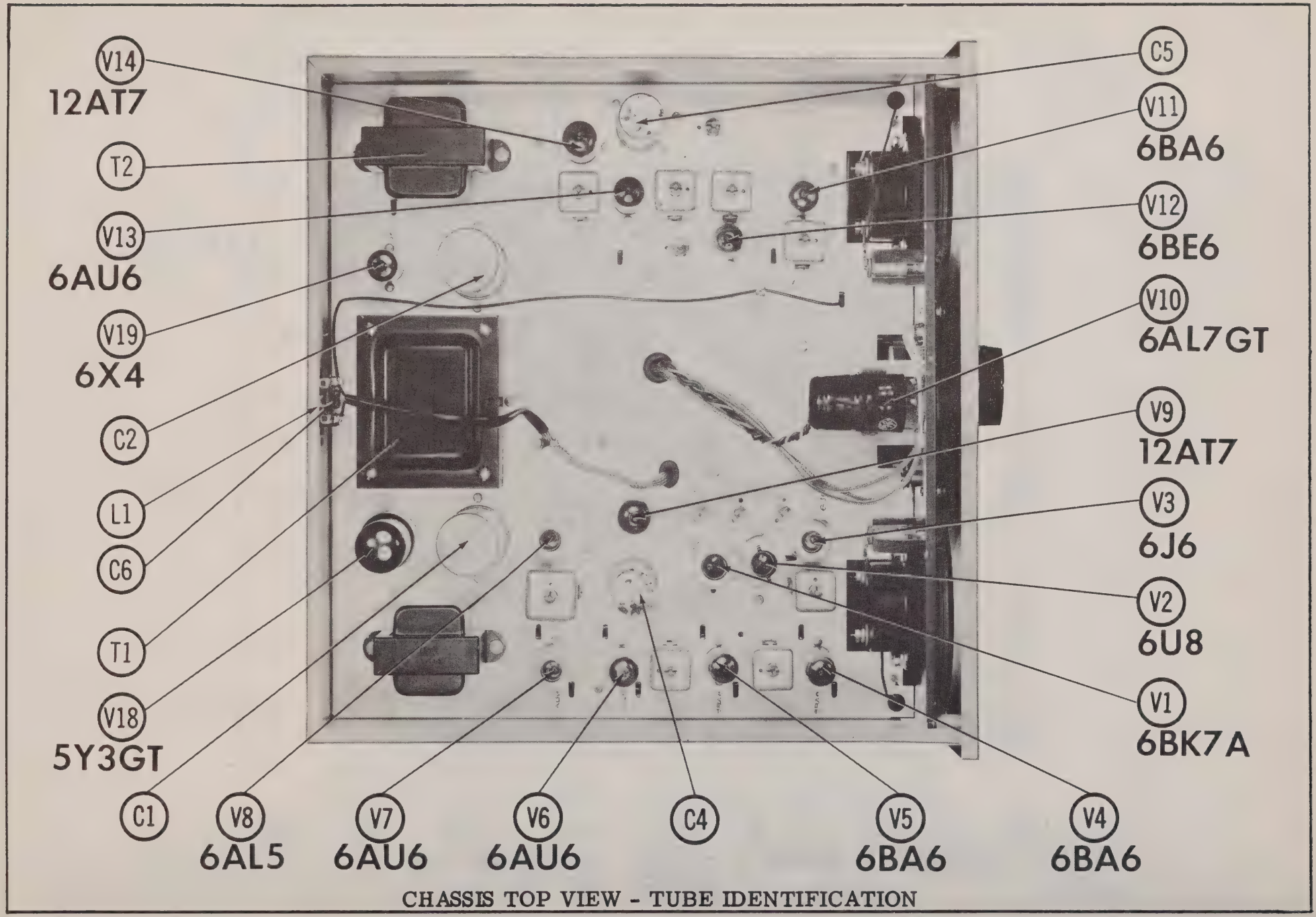


CHASSIS TOP VIEW - ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW - ALIGNMENT AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO



CHASSIS TOP VIEW - TUBE IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V12). Low side to chassis.	455KC (400∿ Mod)	AM	Point of non-interference	DC probe to point (A). Common to chassis.	A1, A2, A3	Insert 10K shunt across A4. Adjust A1, A2, A3 for maximum deflection.
2.	"	"	"	"	"	"	A4	Remove shunt from A4 and insert across A1. Adjust A4 for maximum deflection. Remove 10K shunt.
3.	250Ω Carbon Resistor	Thru dummy to AM Antenna terminal. Low side to "G" term.	600KC	"	600KC	"	A5, A6, A7	Adjust for maximum deflection.
4.	"	"	1500KC	"	1500KC	"	A8, A9 A10	Adjust for maximum deflection. Repeat steps 3 & 4 until signal generator frequency and dial coincide.

WHISTLE FILTER ADJUSTMENT

5.	.01MFD	High side to pin 7 (grid) of 12AT7 (V14). Low side to chassis.	10KC	AM	Point of non-interference	AC VTVM across AM Output Jack	A11	Squelch Switch-Off. Adjust for MINIMUM deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (unmod.)	FM (Squelch Off)	Point of non-interference	DC probe to point (B). Common to chassis.	A12, A13 A14, A15 A16, A17 A18	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (300KC Swp)	FM (Squelch Off)	Point of non-interference	Vert Amp. thru 1 Meg to point (B). Low side to chassis.	A12, A13 A14, A15 A16, A17 A18	Short AVC line to chassis. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert Amp. thru 1 Meg to point (C). Low side to chassis.	A19	Remove short from AVC line. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon Resistor	High side thru 270Ω to FM Antenna terminal. Low side to "G" term.	88MC	FM (AFC fully on)	88MC	DC probe to point (D). Common to chassis.	L7, L6, L3	Adjust for maximum deflection by expanding or compressing coil turns.
9.	"	"	106MC	FM (Squelch Off)	106MC	"	A20, A21, A22	Adjust for maximum deflection.

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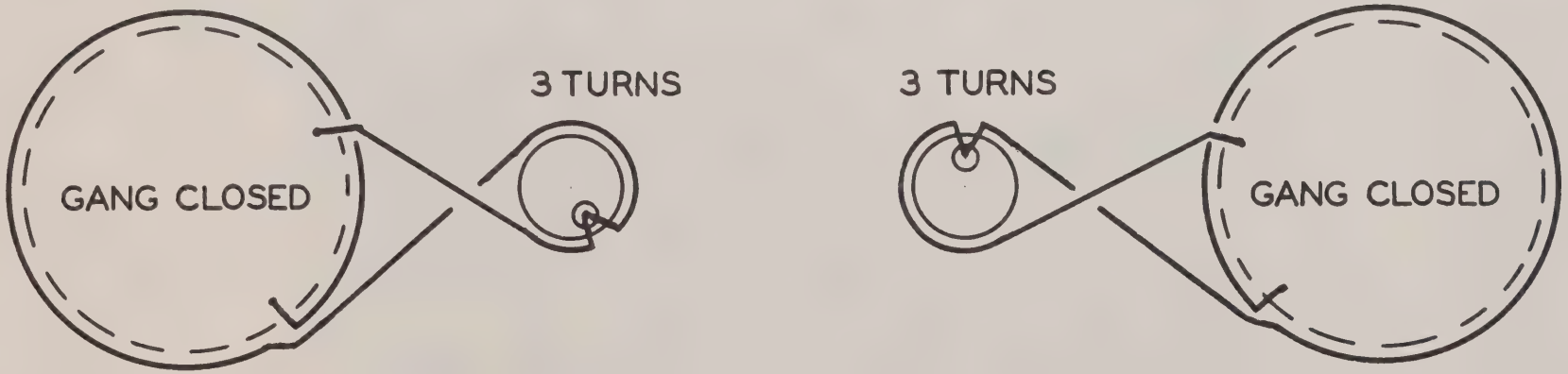
3924 MEADE ST.
DENVER, COLORADO

FIG. 1

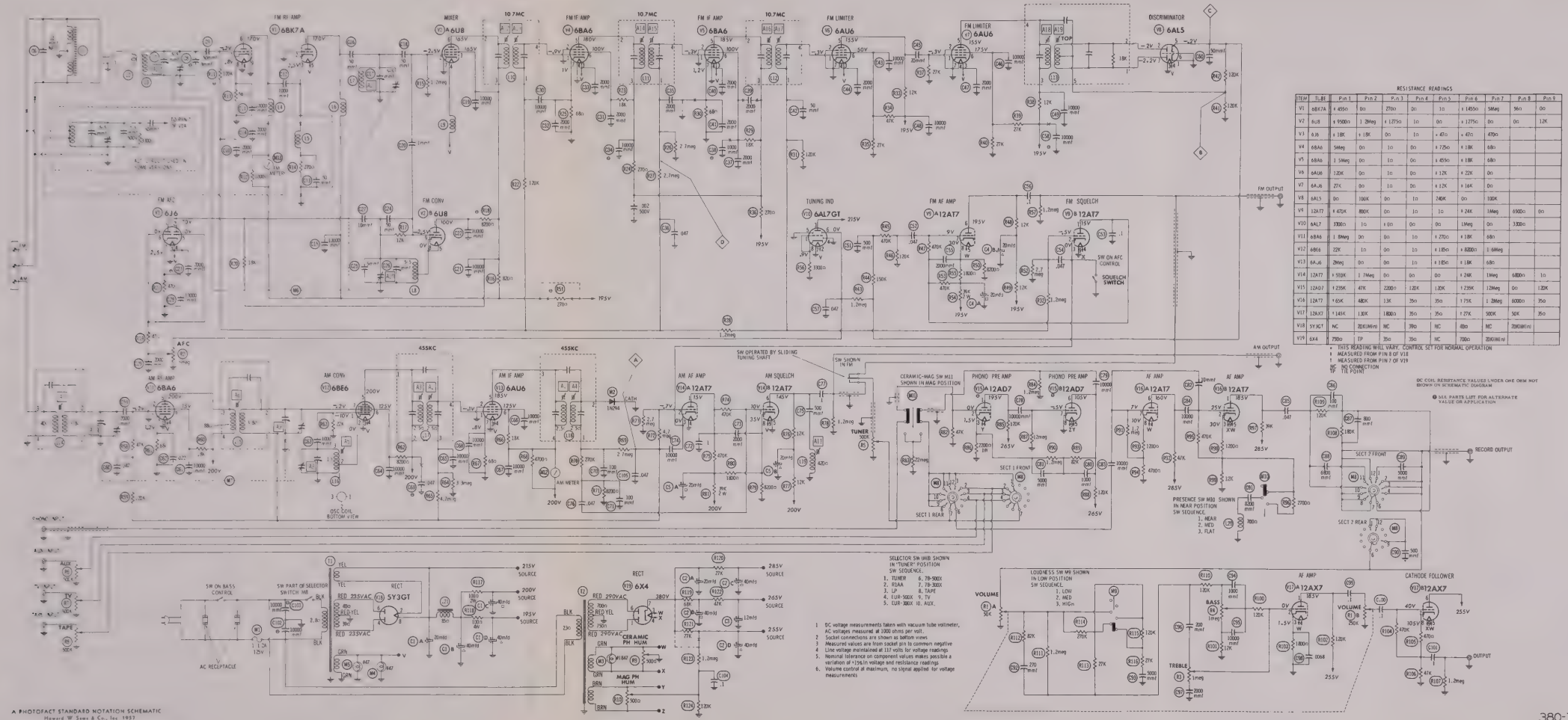
FIG. 2

FM

AM



DIAL CORD DRIVE



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	↑ 455Ω	0Ω	270Ω	0Ω	1Ω	↑ 1455Ω	5Meg	36Ω	0Ω
V2	6U8	↑ 9500Ω	↑ 2Meg	↑ 1275Ω	1Ω	0Ω	↑ 1775Ω	0Ω	0Ω	12K
V3	6J6	↑ 18K	↑ 18K	0Ω	1Ω	↑ 47Ω	↑ 47Ω	470Ω		
V4	6BA6	5Meg	0Ω	1Ω	0Ω	↑ 725Ω	↑ 18K	68Ω		
V5	6BA6	↑ 5Meg	0Ω	1Ω	0Ω	↑ 455Ω	↑ 18K	68Ω		
V6	6AU6	120K	0Ω	1Ω	0Ω	↑ 12K	↑ 22K	0Ω		
V7	6AU6	27K	0Ω	1Ω	0Ω	↑ 12K	↑ 16K	0Ω		
V8	6AL5	0Ω	100K	0Ω	1Ω	240K	0Ω	100K		
V9	12AT7	↑ 470K	800K	0Ω	1Ω	1Ω	↑ 24K	1Meg	650Ω	0Ω
V10	6AL7	3300Ω	1Ω	↑ 0Ω	0Ω	0Ω	1Meg	0Ω	3300Ω	
V11	6BA6	↑ 8Meg	0Ω	0Ω	1Ω	↑ 270Ω	↑ 18K	68Ω		
V12	6BE6	22K	1Ω	0Ω	1Ω	↑ 185Ω	↑ 820Ω	↑ 6Meg		
V13	6AU6	2Meg	0Ω	0Ω	1Ω	↑ 185Ω	↑ 1K	68Ω		
V14	12AT7	↑ 510K	↑ 7Meg	0Ω	0Ω	0Ω	↑ 24K	1Meg	680Ω	1Ω
V15	12AD7	↑ 235K	47K	2200Ω	1.2K	1.2K	↑ 235K	12Meg	0Ω	1.2K
V16	12AT7	↑ 65K	480K	1K	35Ω	35Ω	↑ 75K	↑ 2Meg	600Ω	35Ω
V17	12AX7	↑ 145K	1.8K	1800Ω	35Ω	35Ω	↑ 27K	500K	50K	35Ω
V18	5Y3GT	NC	30K(Min)	NC	39Ω	NC	68Ω	NC	20K(Min)	
V19	6X4	750Ω	TP	35Ω	NC	700Ω		20K(Min)		

* THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION
↑ MEASURED FROM PIN 8 OF V18
↑ MEASURED FROM PIN 7 OF V19
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C33	2000		4259	BPD-002	DD-203	BYA10D2	ED-002	DC522	5HK-D2	
C34	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	②
C35	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C36	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C37	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C38	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	①
C39	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C40	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C41	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C42	50		42005	SI 50	D6-500	LT6Q5	ED-50	UC-545	5GA-Q5	
C43	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C44	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C45	20		42004	SI 20	DD-200	LT6Q2	ED-20	UC-542	5GA-Q2	
C46	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C47	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C48	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C49	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C50	50		42005	BPD-00005	D6-500	LT6Q5	ED-50	UC-545	5GA-Q5	
C51	500		42003	BPD-0005	DD-501	L10T5	ED-500	UC-535	5GAT1	
C52	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C53	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C54	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C55	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C56	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C57	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C58	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	③
C59	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C60	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C61	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C62	.022	400	4260	P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C63	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C64	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C65	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C66	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C67	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C68	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C69	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	④
C70	100		4181	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C71	100		4281	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C72	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C73	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C74	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C75	500		42003	BPD-0005	DD-501	L10T5	ED-500	UC-535	5GA-T5	
C76	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C77	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C78	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C79	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C80	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C81	5000		42002	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C82	10		4212	SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C83	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C84	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C85	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C86	100		4281	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C87	800		4253	BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C88	6800		42072	BPD-0068	D6-682	BYA10D68	GP-6800		5HK-D68	
C89	5000		42002	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C90	500		42003	BPD-0005	DD-501	L10T5	ED-500	UC-535	5GA-T5	
C91	8200		42001							
C92	270		4255	SI 270	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C93	5000		42002	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C94	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C95	10000		4257	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C96	200		4256	BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C97	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C98	.0068	400	4262	P488N-0068	D6-682	CUB4D68	GP-6800	GEM-6268	6TM-D68	
C99	.1	400	4245	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

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PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Electro-Voice PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.					
L2	FM Coupling Coil					
L3	FM Ant. Coil					
L4	RF Choke		19-1001	BC-562	4604	1.7 Microhenries
L5	RF Choke		19-1001	BC-562	4604	1.7 Microhenries
L6	RF Choke		19-1001	BC-562	4604	1.7 Microhenries
L7	FM RF Coil	3590				
L8	FM Osc. Coil	3589				
L9	Fil. Choke		19-1001	BC-562	4604	1.7 Microhenries
L10	1st FM IF	15008	16-3471 ▲	FM-254 *▲	1463 ▲*	
L11	2nd FM IF	15004	16-3471 ▲	FM-254 *▲	1463 ▲*	
L12	3rd FM IF	15004	16-3471 ▲	FM-254 *	1463 ▲*	
L13	Discriminator	15002		FM-250 ▬	1452 ▬	Includes 18K resistor
L14	AM Ant. Trans.	15006				
L15	AM RF Coil	15007				
L16	AM Osc. Coil	15009			70-OSC ♦	
L17	1st AM IF	15003				
L18	2nd AM IF	15005				
L19	10KC Filter	15010				
L20	Tone Choke	1596				165 Millihenries

* Use adapter plate.
▲ Drill new mounting holes.
♦ Disregard primary, Drill new mounting hole.
▬ Parallel secondary with 18K resistor.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L21	.130A	85Ω	3 HY	1599	C5026	C-2974	C-2303	26C88	C-13X ①

① Drill new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Electro-Voice PART No. FUSE	Electro-Voice PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1½A 125V S/B	20171		3130.5 (3AG 1½A 125V S/B)	342001	MDL 1½	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Electro-Voice PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N294	4346	1N54A	1N34A	Audio Det. (Pigtail)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C100	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C101	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C102	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC5I1	5HK-S1	③
C103	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC5I1	5HK-S1	③
C104	.1	200	4265	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C105	.047	400	4243	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	

① Not used in some versions.
② Some versions may use 2000MMF in this application Part #4259.
③ Some versions may use .047MFD in this application Part #4243.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Electro-Voice PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	50K	½	T4686			Q11-123		Volume
B	250K	½				M11-130		Volume
R2A	5Meg	½	U4686	AB-87	A47-5Meg-S	Q11-141	U67	AFC
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	Squelch
R3A	1Meg	½	V4686	AB-70	A47-1Meg-Z	Q13-137	U53	Treble
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
R4A	1Meg	½	W4686	AB-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	Power On-Off
R5A	500K	½	G4686	AB-60	A47-500K-Z	Q13-133	U48	Tuner
B	Shaft			AK-1	FKS-1/4	SQ	Not Req.	
R6A	500K	½	G4686	AB-60	A47-500K-Z	Q13-133	U48	AUX
B	Shaft			AK-1	FKS-1/4	SQ	Not Req.	
R7A	500K	½	G4686	AB-60	A47-500K-Z	Q13-133	U48	TV
B	Shaft			AK-1	FKS-1/4	SQ	Not Req.	
R8A	500K	½	G4686	AB-60	A47-500K-Z	Q13-133	U48	Tape
B	Shaft			AK-1	FKS-1/4	SQ	Not Req.	
R9A	500Ω	½	R4686	AB-4	A47-500-S	Q11-103	U2	Ceramic, Phono Hum Adj.
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R10A	500Ω	½	R4686	AB-4	A47-500-S	Q11-103	U2	Magnetic, Phono Hum Adj.
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Electro-Voice PART No.	IRC PART No.	NOTES
R11	120K		4670	BTS-120K	Note 1
R12	1000Ω		4693	BTS-1000	
R13	56Ω		4622	BTS-56	
R14	270Ω		46034	BTS-270	
R15	1.2Meg		4656	BTS-1.2Meg	
R16	820Ω		4694	BTS-820	
R17	12K		4649	BTS-12K	
R18	8200Ω		46031	BTS-8200	Note 2
R19	47Ω		46035	BTS-47	
R20	18K		46029	BTS-18K	
R21	470Ω		4654	BTS-470	
R22	120K		4670	BTS-120K	
R23	18K		46029	BTS-18K	
R24	270Ω		46034	BTS-270	
R25	68Ω		4631	BTS-68	
R26	2.7Meg		46030	BTS-2.7Meg	
R27	2.7Meg		46030	BTS-2.7Meg	
R28	1.2Meg		4656	BTS-1.2Meg	
R29	18K		46029	BTS-18K	
R30	68Ω		4631	BTS-68	
R31	120K		4670	BTS-120K	
R32	1.2Meg		4656	BTS-1.2Meg	
R33	12K		4649	BTS-12K	
R34	47K		4668	BTS-47K	
R35	27K		4651	BTS-27K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Electro-Voice PART No.	IRC PART No.	NOTES
R36	270Ω		46034	BTS-270	
R37	27K		4651	BTS-27K	
R38	12K		4649	BTS-12K	
R39	27K		4651	BTS-27K	
R40	27K		4651	BTS-27K	
R41	120K		4670	BTS-120K	
R42	120K		4670	BTS-120K	
R43	1.2Meg		4656	BTS-1.2Meg	
R44	150K		4603	BTS-150K	
R45	470K		4650	BTS-470K	
R46	120K		4670	BTS-120K	
R47	470K		4650	BTS-470K	
R48	12K		4649	BTS-12K	
R49	12K		4649	BTS-12K	
R50	8200Ω		46031	BTS-8200	
R51	270Ω		46034	BTS-270	Note 3
R52	2.7Meg		46030	BTS-2.7Meg	
R53	470K		4650	BTS-470K	
R54	39K	2	4682	BTB-39K	
R55	1800Ω		4677	BTS-1800	
R56	3300Ω		46017	BTS-3300	
R57	1.2Meg		4656	BTS-1.2Meg	
R58	47K		4668	BTS-47K	
R59	120K		4670	BTS-120K	
R60	18K		46029	BTS-18K	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M3	Indicator Lamp		#1847 (Hum Adjust)
M4	Dial Lamp		#47 (AM Dial)
M5	Dial Lamp		#47 (FM Dial)
M6	FM Tuning Cap.	42011	Three Gang
M7	AM Tuning Cap.	42012	Three Gang (Ant. 15-400MMF, RF 15-400MMF, Osc. 35-200MMF)
M8	Switch		Selector (Rotary Wafer Type)
M9	Switch		Loudness (Slide Type DPDT)
M10	Switch		Presence (Slide Type DPDT)
M11	Switch		Magnetic-Ceramic (Slide Type DPST)
M12	Meter		AM Signal Strength
M13	Meter		FM Signal Strength

PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BK7A	
V2	FM Mixer-FM Osc.	6U8	
V3	FM AFC	6J6	
V4	1st FM IF Amplifier	6BA6	
V5	2nd FM IF Amplifier	6BA6	
V6	1st FM Limiter	6AU6	
V7	2nd FM Limiter	6AU6	
V8	Discriminator	6AL5	
V9	FM AF Amp. - Squelch	12AT7	
V10	FM Tuning Indicator	6AL7GT	

ITEM No.	USE	TYPE	NOTES
V11	AM RF Amplifier	6BA6	
V12	AM Converter	6BE6	
V13	AM IF Amplifier	6AU6	
V14	AM AF Amp. - AM Squelch	12AT7	
V15	Phono Preamplifier	12AD7	
V16	AF Amplifier	12AT7	
V17	AF Amp.-Cath. Follower	12AX7	
V18	Rectifier	5Y3GT	
V19	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Electro-Voice PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	20	350	4299		C0350	FP377		T-110	R2287 *
B	▲40	350			BR2035	TC65			
C	■40	350							
D	▲40	350							
C2A	20	350	4299						
B	■40	350							
C	▲40	350							
D	▲40	350							
C3	12	250	42064	PRS250V12	BBR12-250	TC53	TD-12-250	MT-2512	TVA-1505
C4A	■20	350	42010	AFH2-37	B0300	FP227	TMD-35	D-160	TVL-2626
B	▲20	350							
C5A	■20	350	42010	AFH2-37	B0300	FP227	TMD-35	D-160	TVL-2626
B	▲20	350							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	10			NP0-SI 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	NP0 ①
C7	.5-5		42009				532-A			
C8	3			NP0-SI 3.0		C10V3C	TCO-3	ZT-553		①
C9	50		42005	BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C10	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C11	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C12	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C13	50		42005	BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C14	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C15	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C16	50		42005	BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C17	.5-5		42009				532-A			
C18	50		42005	BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C19	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C20	1.0		42006	NP0-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C21	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C22	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C23	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	①
C24	50		42005	BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C25	5		42007	SI 5	D6-050	LT6V5	GP-5	ZT-555	5GA-V5	
C26	.5-5		42009				532-A			
C27	10		4212	SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C28	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C29	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C30	10000		4252	BPD-01	DD-103	BYA6SI	ED-01	DC511	5HK-SI	
C31	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C32	2000		4259	BPD-002	DD-203	BYA10D2	ED-002	DC522	5HK-D2	

PARTS LIST AND DESCRIPTIONS (Continued)
RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Electro-Voice PART No.	IRC PART No.	NOTES
R61	68Ω		4631	BTS-68	
R62	8200Ω		46031	BTS-8200	
R63	22K		4678	BTS-22K	
R64	3.3Meg		46033	BTS-3.3Meg	
R65	4.7Meg		46026	BTS-4.7Meg	
R66	18K		46029	BTS-18K	
R67	68Ω		4631	BTS-68	
R68	4700Ω		4675	BTS-4700	
R69	2.7Meg		46030	BTS-2.7Meg	
R70	270K		4669	BTS-270K	
R71	8200Ω		46031	BTS-8200	
R72	4.7Meg		46026	BTS-4.7Meg	
R73	2.7Meg		46030	BTS-2.7Meg	
R74	470K		4650	BTS-470K	
R75	470K		4650	BTS-470K	
R76	12K		4649	BTS-12K	
R77	12K		4649	BTS-12K	
R78	1.2Meg		4656	BTS-1.2Meg	
R79	8200Ω		46031	BTS-8200	
R80	1800Ω		4677	BTS-1800	
R81	39K	2	4682	BTB-39K	
R82	47K		4668	BTS-47K	
R83	22Meg		4606	BTS-22Meg	
R84	1.2Meg		4656	BTS-1.2Meg	
R85	120K		4670	BTS-120K	
R86	2200Ω	1	46060	BTA-2200	
R87	12Meg		4672	BTS-12Meg	
R88	120K		4670	BTS-120K	
R89	82K		4696	BTS-82K	
R90	1.2Meg		4656	BTS-1.2Meg	
R91	1.2Meg		4656	BTS-1.2Meg	
R92	47K		4668	BTS-47K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Electro-Voice PART No.	IRC PART No.	NOTES
R93	1200Ω		4658	BTS-1200	
R94	4700Ω		4675	BTS-4700	
R95	470K		4650	BTS-470K	
R96	2700Ω		46036	BTS-2700	
R97	39K		4697	BTS-39K	
R98	1200Ω		4658	BTS-1200	
R99	12K		4649	BTS-12K	
R100	120K		4670	BTS-120K	
R101	12K		4649	BTS-12K	
R102	120K		4670	BTS-120K	
R103	1800Ω		4677	BTS-1800	
R104	470K		4650	BTS-470K	
R105	470Ω		4654	BTS-470	
R106	47K		4668	BTS-47K	
R107	1.2Meg		4656	BTS-1.2Meg	
R108	180K		4671	BTS-180K	
R109	120K		4670	BTS-120K	
R110	120K		4670	BTS-120K	
R111	1.2Meg		4656	BTS-1.2Meg	
R112	82K		4696	BTS-82K	
R113	27K		4651	BTS-27K	
R114	270K		4669	BTS-270K	
R115	120K		4670	BTS-120K	
R116	27K		4651	BTS-27K	
R117	100Ω	2	4655	BTB-100	
R118	100Ω	4	4684	PW4-100	
R119	68K		46019	BTS-68K	
R120	27K		4651	BTS-27K	
R121	27K		4651	BTS-27K	
R122	47K		4668	BTS-47K	
R123	1.2Meg		4656	BTS-1.2Meg	
R124	120K		4670	BTS-120K	

Note 1. Some versions may use 1.2Meg in this application (Part #4656).
Note 2. Some versions may use 4700Ω in this application (Part #4675).
Note 3. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .77A	460VCT @ .140A	5VAC @ 2A	6.3VAC @ 4.8A	1598					
T2	117VAC @ .16A	560VCT @ .008A	6.3VAC @ 1.3A	6.3VAC @ .43A	15001					

PHOTOFACT* Folder

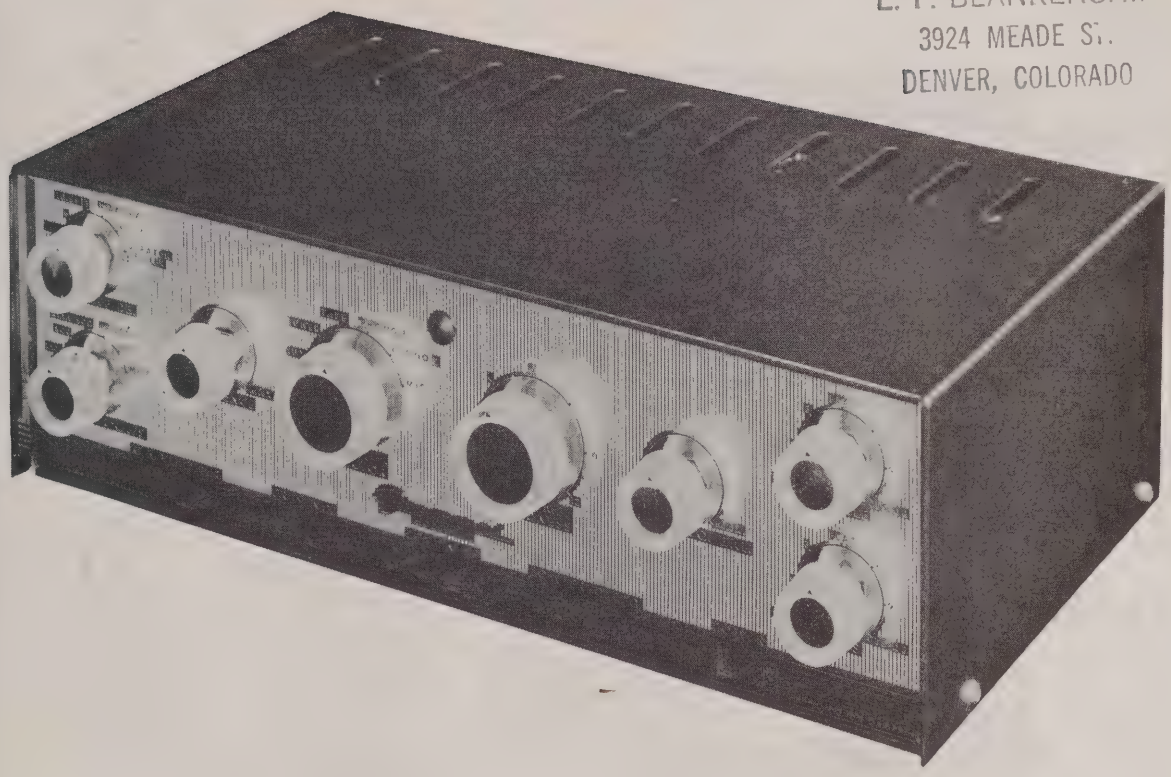
*TRADE MARK

RETMA MEMBER

GROMMES MODEL 212

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

GROMMES MODEL 212

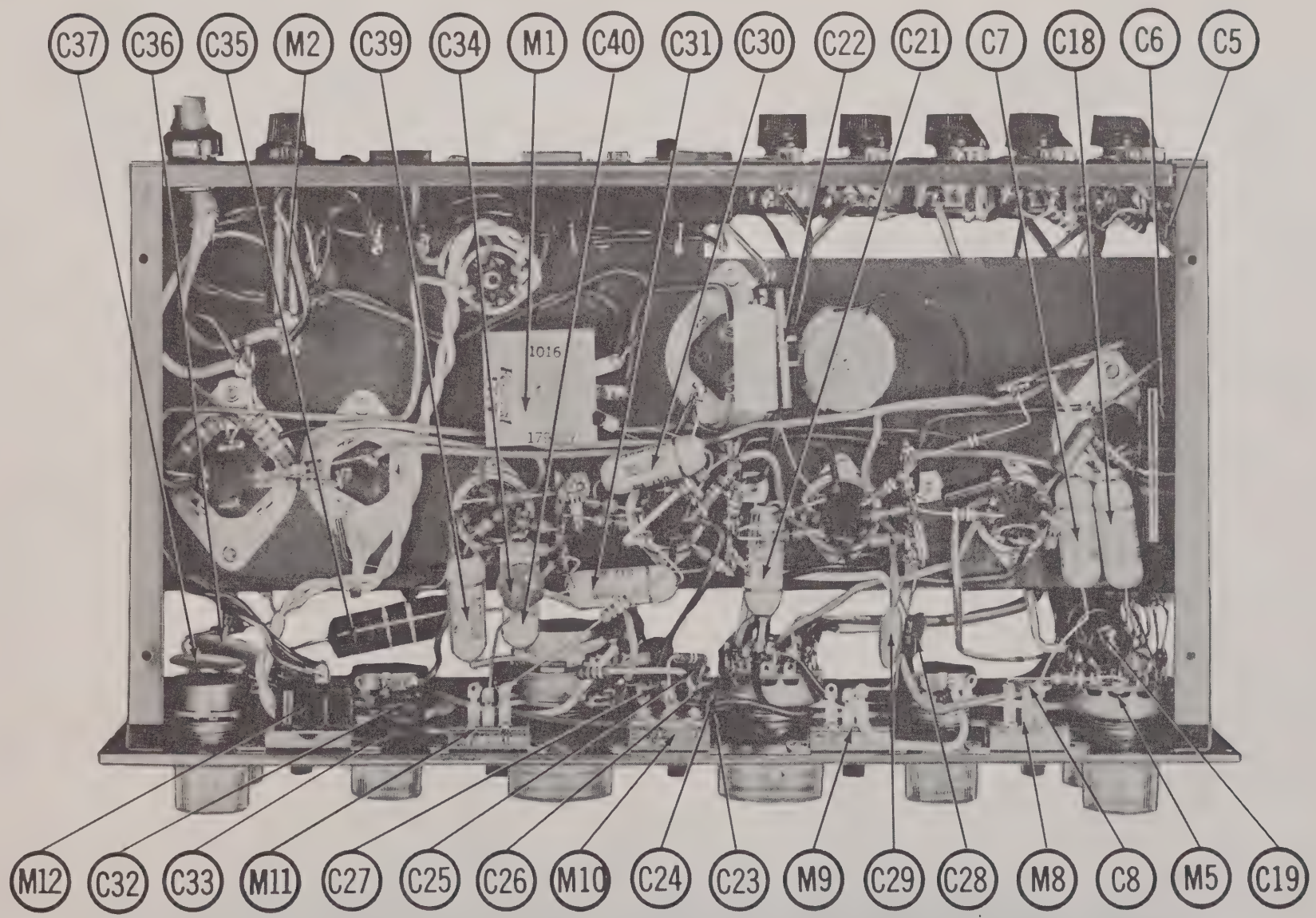


GROMMES MODEL 212

TRADE NAME	Grommes Model 212
MANUFACTURER	Precision Electronics, Inc., 9101 King Ave., Franklin Park, Ill.
TYPE SET	AC Operated 8 Channel Preamplifier
TUBES (Five)	Types 12AX7 Phono Preamplifier, 12AX7 AF Amp.-Cath. Follower, 12AX7 AF Amplifier, 12AX7 AF Amp.-Cath. Follower, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC (22 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

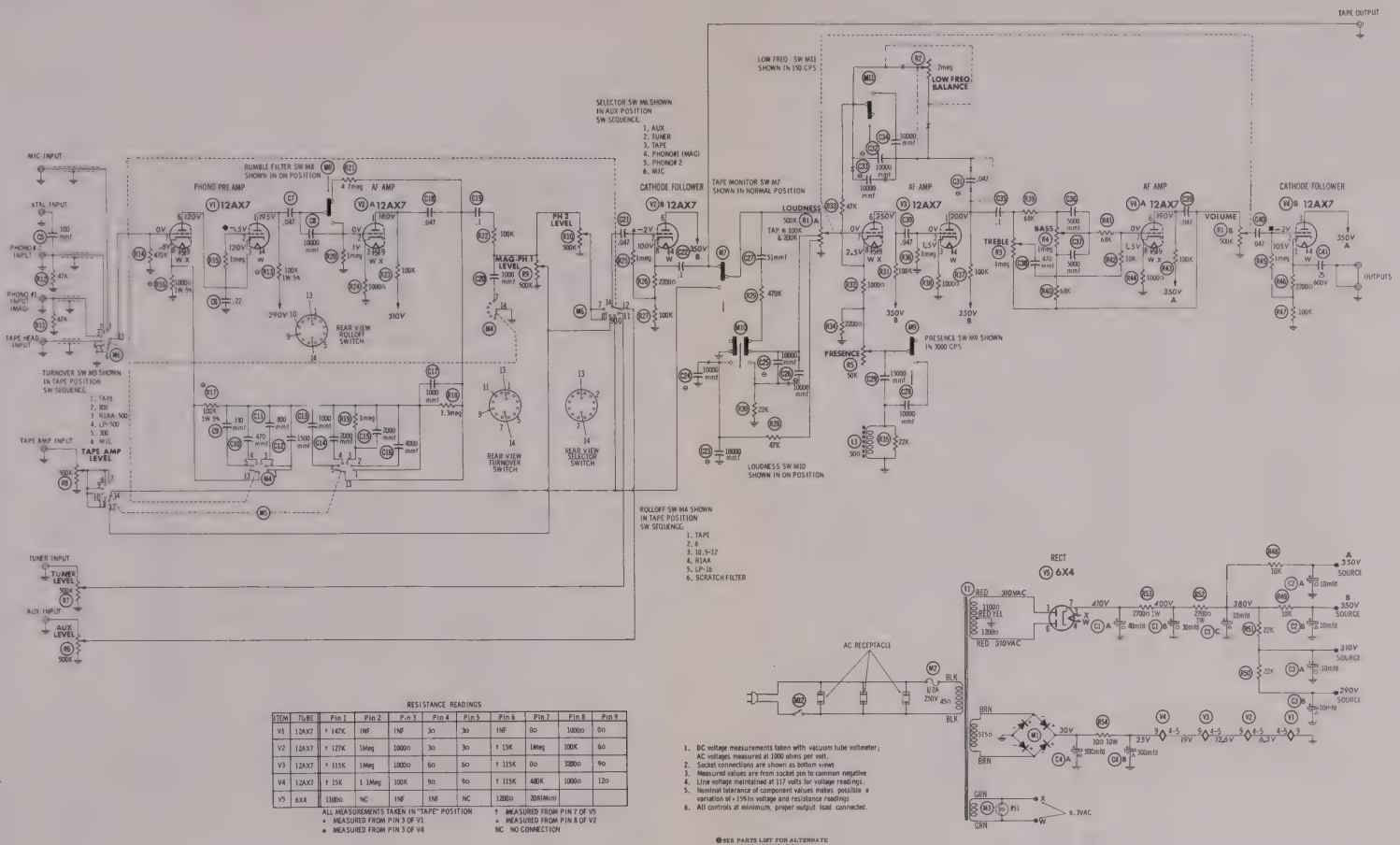


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

GROMMES
MODEL 212



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 147K	INF	INF	3Ω	3Ω	INF	0Ω	1000Ω	0Ω
V2	12AX7	† 127K	1Meg	1000Ω	3Ω	3Ω	† 15K	1Meg	100K	6Ω
V3	12AX7	† 115K	1Meg	1000Ω	6Ω	6Ω	† 115K	0Ω	3200Ω	9Ω
V4	12AX7	† 15K	‡ 1Meg	100K	9Ω	9Ω	† 115K	480K	1000Ω	12Ω
V5	6X4	1100Ω	NC	INF	INF	NC	1200Ω	20K(Min)		

ALL MEASUREMENTS TAKEN IN "TAPE" POSITION
* MEASURED FROM PIN 3 OF V1
● MEASURED FROM PIN 3 OF V4
† MEASURED FROM PIN 7 OF V5
▲ MEASURED FROM PIN 8 OF V2
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

●SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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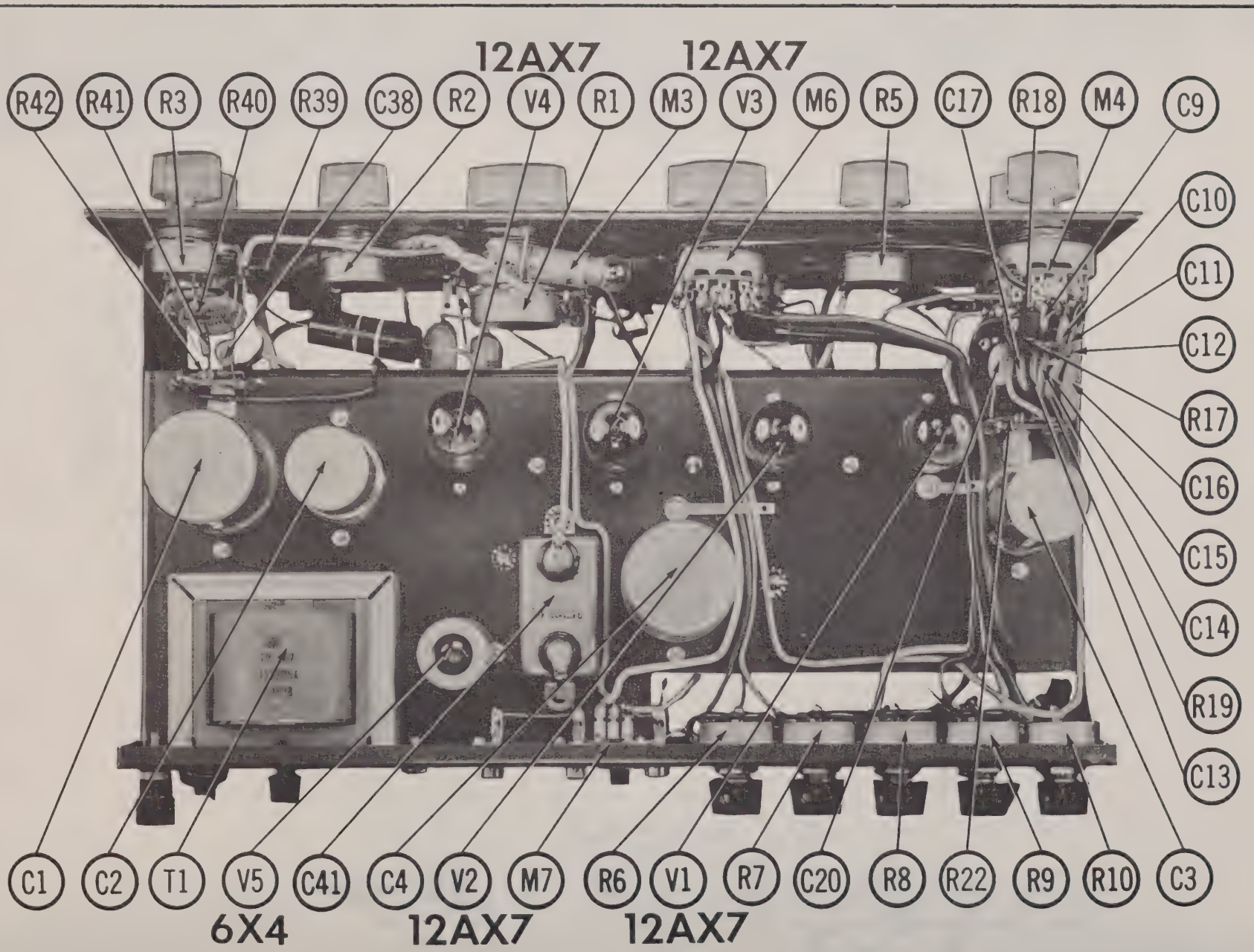


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamplifier	12AX7	
V2	AF Amp. - Cath. Follower	12AX7	
V3	AF Amplifier	12AX7	
V4	AF Amp. - Cath. Follower	12AX7	
V5	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰40	400		AFH4-117-48	B0420			D-400	
B	■30	350			BR1045			MT-4530	
C	▲10	300							
C2A	■10	350		AFH2-47	B0370	FP231	TMD-47	D-200	TVL-2750
B	▲10	350							
C3A	■10	350		AFH2-47	B0370	FP231	TMD-47	D-200	TVL-2750
B	▲10	350							
C4A	▰500	25			BR5002	WD065	TD-500-25	MTH-2550	TVL-2233
B	▲500	25			BR5002	TC2505	TD-500-25	MTH-2550	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	100			1468-0001	D6-101	5W5T1	ED-100	MC235	1FM-31	
C6	.22	200		P288N-22		CUB2P22		GEM-2022	2TM-P22	
C7	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C10	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C11	800			BPD-0008	DD-801	L10T8			5GA-T8	
C12	1500			BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C13	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C14	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C15	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C16	4000			BPD-004	DD-402	BYA10D4	ED-004	UC-524	5HK-D4	
C17	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C18	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C19	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C20	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C21	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C22	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C23	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	①
C24	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	①
C25	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	②
C26	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	②
C27	51			SI 51			GP-51			
C28	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C29	15000			BPD-015	DD16-153	BYA10S15	ED-015		5HK-S15	
C30	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C31	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	④
C32	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	③
C33	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	③
C34	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C35	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C36	5000			BPD-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C37	5000			BPD-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C38	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C39	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C40	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C41	.25	600								

① When C23 is 20000MMF C24 is not used.
② When C25 is 20000MMF C26 is not used.
③ When C32 is 20000MMF C33 is not used.
④ Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2	LC2X500K			Q18-133XX		Loudness, Tap@ 100K & 200K
B	500K	1/2				M11-133		Volume
R2A	2Meg	1/2	LFBC2M	B-76	A47-2Meg-Z	Q13-139	U55	Low Freq. Bal.
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	1Meg	1/2	GTC-1M	B-69	A47-1Meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R4A	1Meg	1/2	GTC-1M	B-69	A47-1Meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	50K	1/2	PC50K	B-34	A47-75K-V	Q14-123	U34	Presence
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6A	500K	1/2	VC500K	B-60	A47-500K-Z	Q13-133	U48	Input Level AUX.
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R7A	500K	1/2	VC500K	B-60	A47-500K-Z	Q13-133	U48	Input Level Tuner
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R8A	500K	1/4	VC500K	B-60	A47-500K-Z	Q13-133	U48	Input Level Tape Amp.
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R9A	500K	1/4	VC500K	B-60	A47-500K-Z	Q13-133	U48	Input Level Mag. Phono #1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R10A	500K	1/2	VC500K	B-60	A47-500K-Z	Q13-133	U48	Input Level Phono #2
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA GROMMES PART No.	IRC PART No.	NOTES
R11	47K			BTS-47K	
R12	47K			BTS-47K	
R13	100K 5%	1			Note 1
R14	470K			BTS-470K	
R15	1Meg			BTS-1Meg	
R16	1000Ω 5%	1			Note 1
R17	100K 5%	1			Note 1
R18	3.3Meg			BTS-3.3Meg	
R19	1Meg			BTS-1Meg	
R20	1Meg			BTS-1Meg	
R21	4.7Meg			BTS-4.7Meg	
R22	100K			BTS-100K	
R23	100K			BTS-100K	
R24	1000Ω			BTS-1000	
R25	1Meg			BTS-1Meg	
R26	2200Ω			BTS-2200	
R27	100K			BTS-100K	
R28	47K			BTS-47K	
R29	470K			BTS-470K	
R30	22K			BTS-22K	
R31	100K			BTS-100K	
R32	1000Ω			BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA GROMMES PART No.	IRC PART No.	NOTES
R33	47K			BTS-47K	
R34	2200Ω			BTS-2200	
R35	22K			BTS-22K	
R36	1Meg			BTS-1Meg	
R37	100K			BTS-100K	
R38	1000Ω			BTS-1000	
R39	68K			BTS-68K	
R40	68K			BTS-68K	
R41	68K			BTS-68K	
R42	10K			BTS-10K	
R43	100K			BTS-100K	
R44	1000Ω			BTS-1000	
R45	1Meg			BTS-1Meg	
R46	2200Ω			BTS-2200	
R47	100K			BTS-100K	
R48	10K			BTS-10K	
R49	10K			BTS-10K	
R50	22K			BTS-22K	
R51	22K			BTS-22K	
R52	2700Ω	1		BTA-2700	
R53	2700Ω	1		BTA-2700	
R54	10Ω	10		PW10-10	

Note 1. Low noise deposited carbon resistor.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .25A	640VCT @ .010A	6.3VAC @ .8A	23VAC @ .300A	TP-212					

PARTS LIST AND DESCRIPTIONS (Continued)

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		GROMMES PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Tone Choke					220 Millihenries

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	GROMMES PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.3A		1017	C1B	604B	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	½A 250V			312.500 (3AG ½A 250V)	342001	AGC½	HKP

MISCELLANEOUS

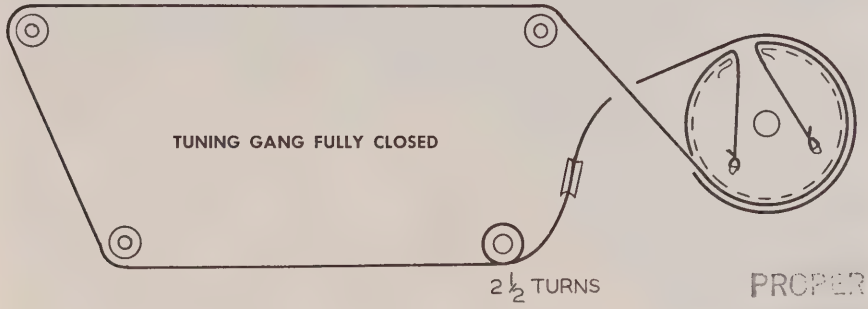
ITEM No.	PART NAME	GROMMES PART No.	NOTES
M3	Pilot Lamp		#51
M4	Switch		Rolloff DB (Rotary Wafer Type)
M5	Switch		Turnover CPS (Rotary Wafer Type)
M6	Switch		Input Selector (Rotary Wafer Type)
M7	Switch		Tape Monitor (Slide Type SPDT)
M8	Switch		Rumble Filter (Slide Type SPDT)
M9	Switch		Presence (Slide Type SPDT)
M10	Switch		Loudness (Slide Type DPST)
M11	Switch		Low Freq. (Slide Type SPDT)
M12	Switch		Power On-Off (Slide Type SPDT)

PHOTOFACT* Folder

*TRADE MARK

HARMAN-KARDON
MODEL TA-1040

TRADE NAME	Harman-Kardon Model TA-1040 (Festival II)		
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L.I., N.Y.		
TYPE SET	AC Operated FM-AM Receiver		
TUBES	Twenty One		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	1 Amp. @ 117 Volts AC (115 Watts)
TUNING RANGE—BROADCAST	530-1650KC	FREQ. MOD.	88-108MC



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DIAL CORD STRINGING

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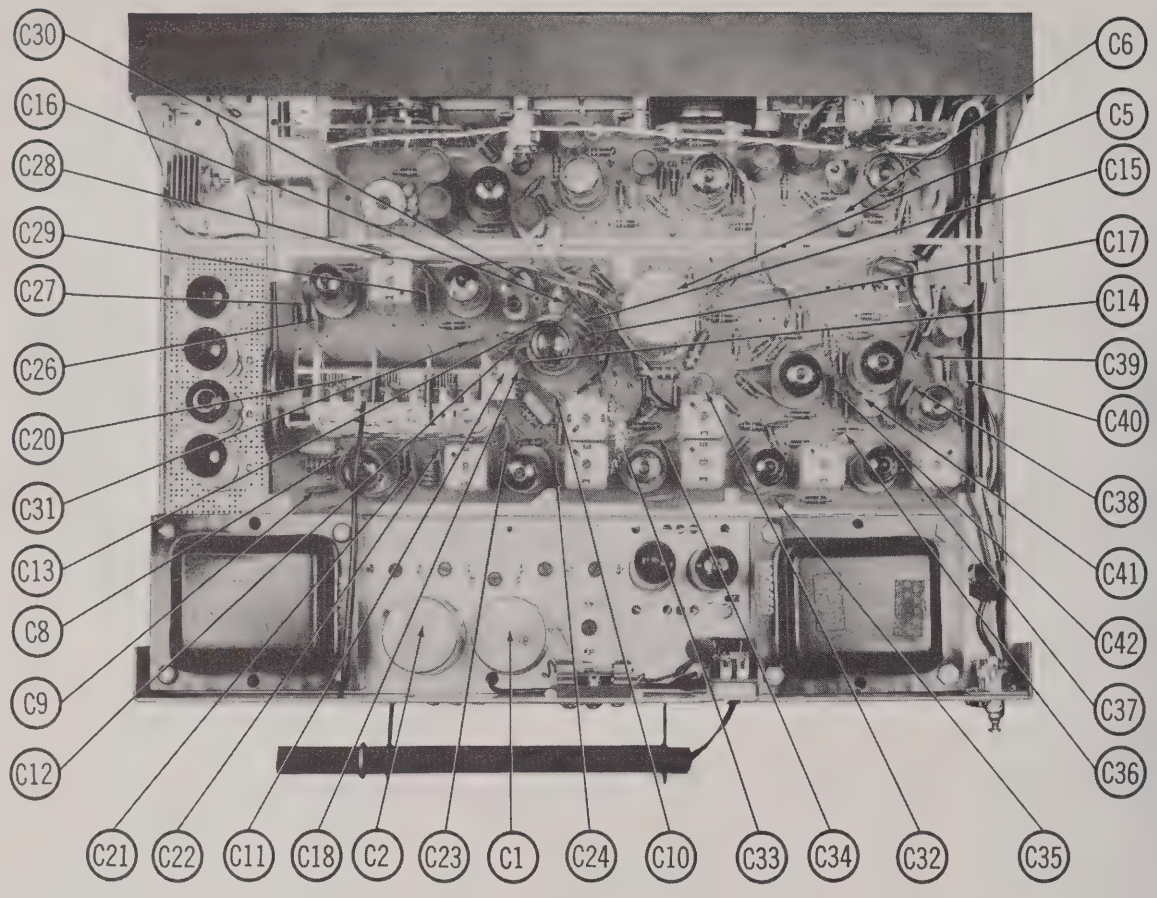
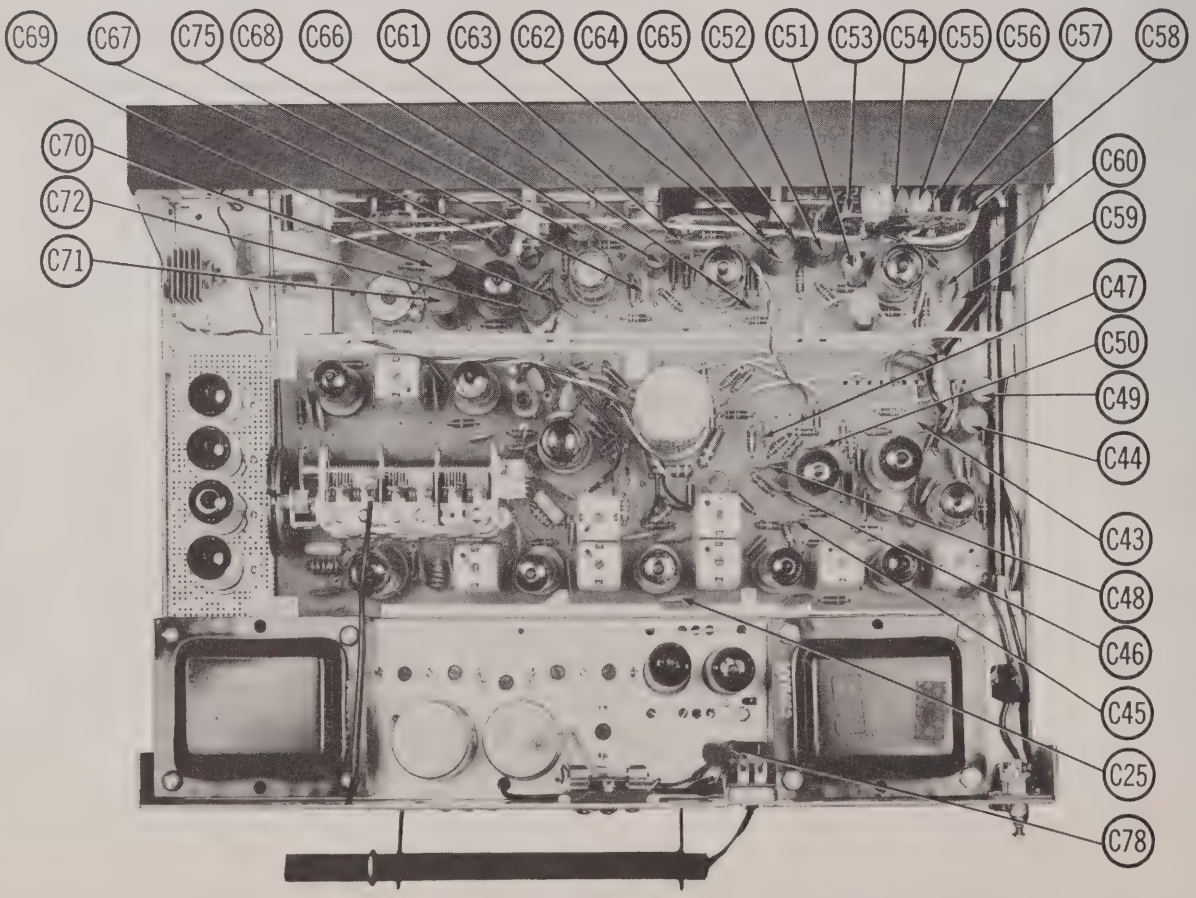
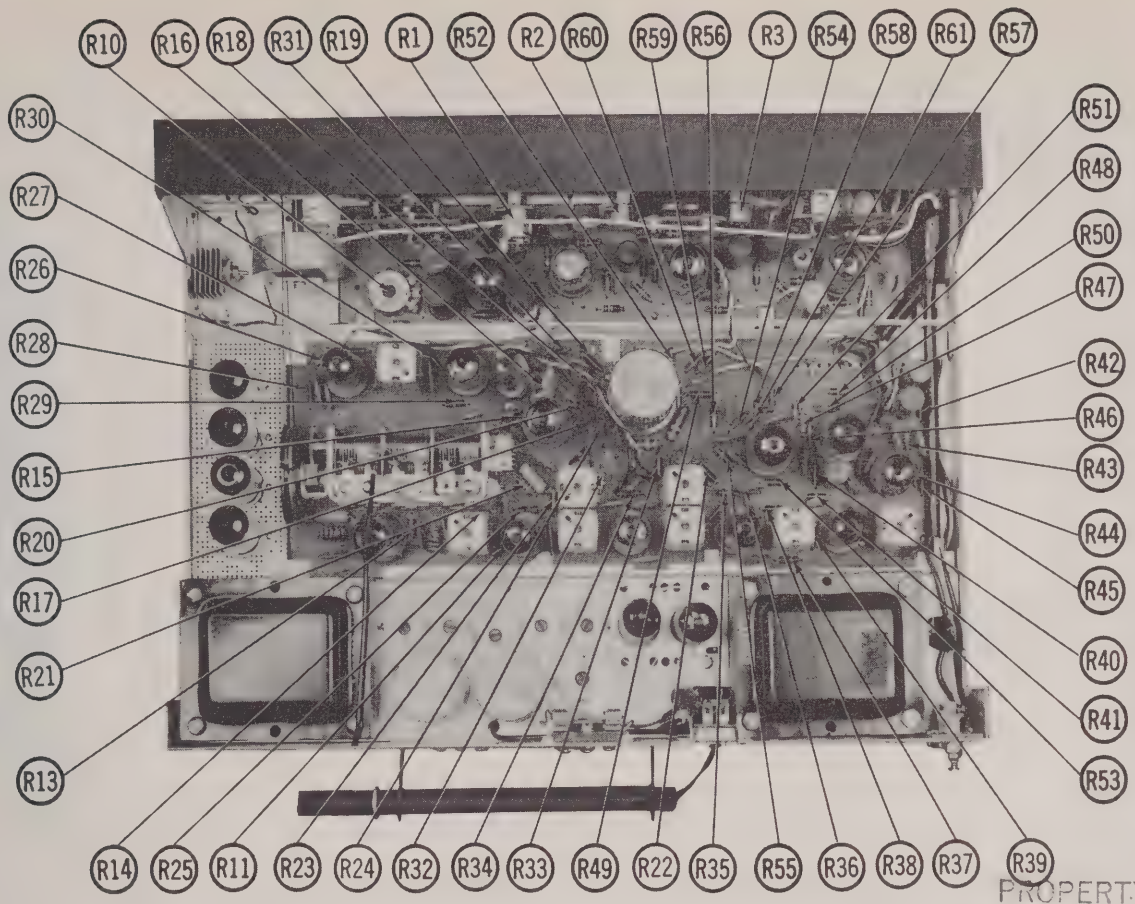


CHASSIS TOP VIEW — CAPACITOR IDENTIFICATION



CHASSIS TOP VIEW — CAPACITOR IDENTIFICATION



CHASSIS TOP VIEW — RESISTOR IDENTIFICATION

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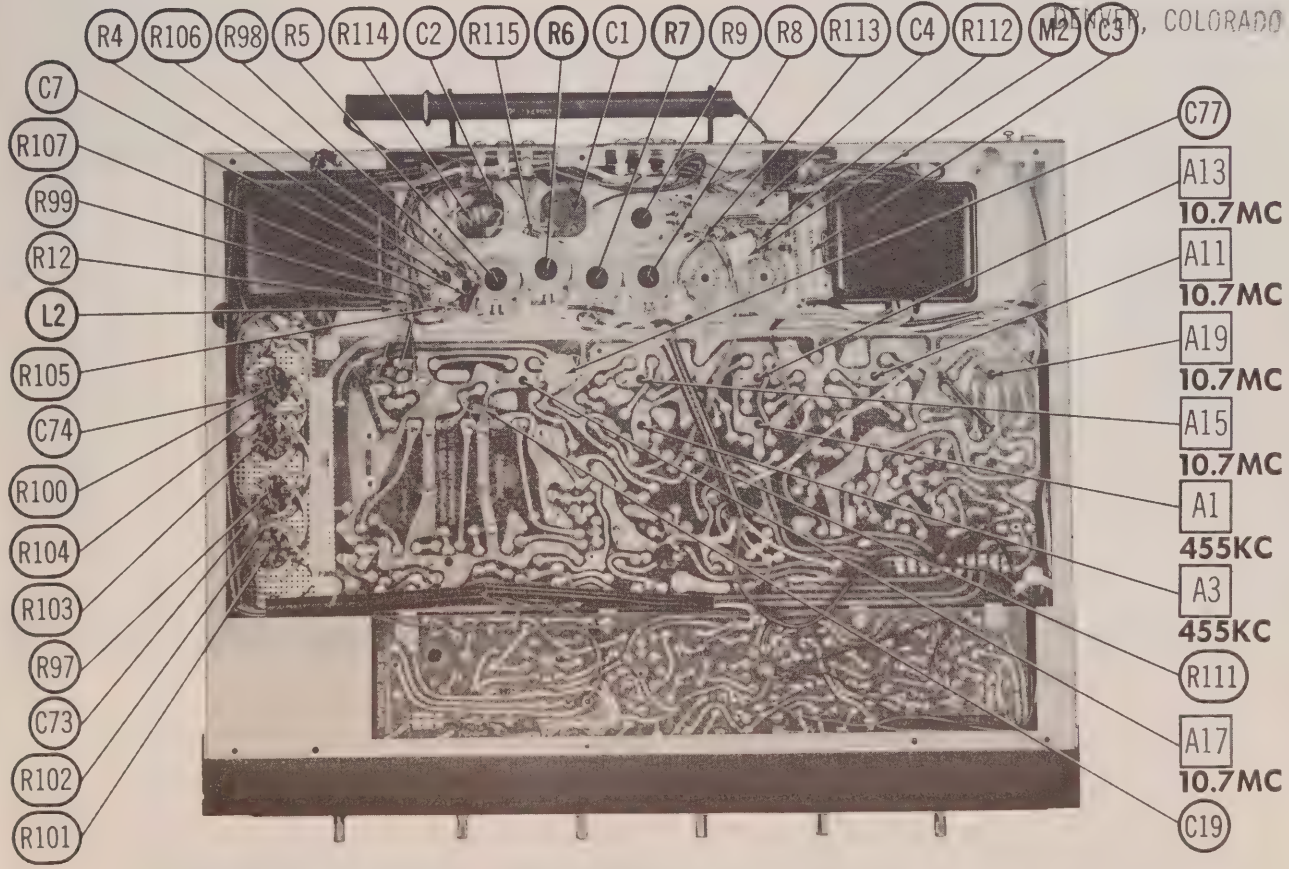


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. - FM Mixer	6BK7A	
V2	FM Osc. - FM AFC	6BK7A	
V3	1st FM IF Amplifier	6BA6	
V4	AM RF Amplifier	6BA6	
V5	AM Converter	6BE6	
V6	2nd FM IF Amplifier - 1st AM IF Amplifier	6BA6	
V7	1st FM Limiter - AM Det.	6AU6	
V8	2nd FM Limiter	6AU6	
V9	Discriminator	6AL5	
V10	Noise Gate - Cath. Follower	12AU7A	
V11	AM AF Amplifier - Meter Cath. Follower	12AU7A	
V12	Phono Preamplifier	12AX7	
V13	Cath. Follower-AF Amp.	12AX7	
V14	AF Amplifier	12AV6	
V15	AF Amp. - Phase Inv.	12AT7	
V16	Output	12AB5	
V17	Output	12AB5	
V18	Output	12AB5	
V19	Output	12AB5	
V20	Rectifier	EZ81/6CA4	
V21	Rectifier	EZ81/6CA4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	475	JE10071739	AFH1-56-10	AO516	FP280	TMD-61	S-300	TVL-1820
C2A	▲20	475	JE10071740	AFH2-69	BO500	FP284	TMD-61	D-270	TVL-2935
B	▲20	475							
C3	16	150		PRS150V16	BBR16-150	TC44	TD-16-150	MT-1516	TVA-1409
C4	8	150		PRS150V8	BBR8-150	TC41	TD-8-150	MT-1508	TVA-1405
C5A	■40	150	JE1121846						R2440 *
B	▲60	150							
C	60	150							
D	▲10	150							
C6	10	150		PRS150V10	BBR10-150	TC42	TD-10-150	MT-1510	TVA-1406

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	470			SI470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C8	47			N750-SI47	TCN-47	C10V47U	TC7-47	NT-5447	5TCU-Q47	N750
C9	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	1-10		JV20688							
C12	100			BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C13	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C14	10			SI10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C15	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	Note 1
C16	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	Note 2
C17	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C18	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C19	2.2			NPO-SI2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	
C20	.68				TCZ-R68		TCO-.68			
C21	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C22	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C24	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C25	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	Note 3
C26	100			N750-SI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C27	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C28	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C29	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C30	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C31	47			N750-SI47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C32	.05	200		BPD-05	DF-503	BC2S47J		ACE6147	2SE-S47	
C33	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	N750 Note 2
C34	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C35	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C36	47			N750-SI47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C37	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C38	100			N750-SI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C39	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C40	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C41	.1	200		P288N-1		BC2P1J		ACE601	2SE-P1	
C42	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Harman-Kardon PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R11	1000Ω			BTS-1000	
R12	100Ω			BTS-100	
R13	3.3Meg			BTS-3.3Meg	
R14	1000Ω			BTS-1000	
R15	22K			BTS-22K	
R16	1000Ω			BTS-1000	
R17	100Ω			BTS-100	
R18	470K			BTS-470K	
R19	1Meg			BTS-1Meg	
R20	1000Ω			BTS-1000	
R21	470K			BTS-470K	
R22	2.2Meg			BTS-2.2Meg	
R23	1000Ω			BTS-1000	
R24	470Ω			BTS-470	
R25	68Ω			BTS-68	
R26	1Meg			BTS-1Meg	
R27	1000Ω			BTS-1000	
R28	100Ω			BTS-100	
R29	22K			BTS-22K	
R30	1Meg			BTS-1Meg	
R31	1000Ω			BTS-1000	
R32	470K			BTS-470K	
R33	1000Ω			BTS-1000	
R34	68Ω			BTS-68	
R35	150K			BTS-150K	
R36	150K			BTS-150K	
R37	15K			BTS-15K	
R38	10K			BTS-10K	
R39	100K			BTS-100K	
R40	1Meg			BTS-1Meg	
R41	22K			BTS-22K	
R42	33K			BTS-33K	
R43	33K			BTS-33K	
R44	100K			BTS-100K	
R45	100K			BTS-100K	
R46	1Meg			BTS-1Meg	
R47	470K			BTS-470K	
R48	47K			BTS-47K	
R49	100K			BTS-100K	
R50	6800Ω			BTS-6800	
R51	47K			BTS-47K	
R52	100K			BTS-100K	
R53	10Meg			BTS-10Meg	
R54	82K			BTS-82K	
R55	150K			BTS-150K	
R56	150K			BTS-150K	
R57	1Meg			BTS-1Meg	
R58	3.3Meg			BTS-3.3Meg	
R59	68K			BTS-68K	
R60	68K			BTS-68K	
R61	1000Ω			BTS-1000	
R62	47K			BTS-47K	
R63	56K			BTS-56K	
R64	560K			BTS-560K	
R65	680K			BTS-680K	
R66	820Ω			BTS-820	Note 1
R67	220K			BTS-220K	
R68	270K			BTS-270K	
R69	1500Ω			BTS-1500	
R70	2.2Meg			BTS-2.2Meg	
R71	68K			BTS-68K	
R72	1Meg			BTS-1Meg	
R73	470K			BTS-470K	
R74	2.2Meg			BTS-2.2Meg	
R75	1Meg			BTS-1Meg	
R76	1500Ω			BTS-1500	
R77	100K			BTS-100K	
R78	470K			BTS-470K	
R79	1000Ω			BTS-1000	
R80	270K			BTS-270K	
R81	1500Ω			BTS-1500	
R82	100K			BTS-100K	
R83	100K			BTS-100K	
R84	56K			BTS-56K	
R85	56K			BTS-56K	
R86	56K			BTS-56K	
R87	180K			BTS-180K	
R88	390K			BTS-390K	
R89	470K			BTS-470K	
R90	470K			BTS-470K	
R91	1Meg			BTS-1Meg	
R92	1200Ω			BTS-1200	
R93	68K			BTS-68K	
R94	47K			BTS-47K	
R95	47K			BTS-47K	
R96	27K			BTS-27K	
R97	1000Ω			BTS-1000	
R98	150K			BTS-150K	
R99	150K			BTS-150K	
R100	1000Ω			BTS-1000	
R101	1000Ω			BTS-1000	Note 2
R102	1000Ω			BTS-1000	Note 2
R103	1000Ω			BTS-1000	Note 2
R104	1000Ω			BTS-1000	Note 2
R105	27K			BTS-27K	
R106	47K			BTS-47K	
R107	47K			BTS-47K	
R108	10K			BTS-10K	
R109	330Ω	1		BTA-330	
R110	330Ω	1		BTA-330	
R111	33Ω			BTS-33	Note 3
R112	2200Ω			BTS-2200	
R113	56K			BTS-56K	Note 4
R114	27K	2		BTB-27K	
R115	4700Ω			BTS-4700	

Note 1. Some versions may use 2200Ω in this application.
Note 2. Not used in some versions.
Note 3. Some versions may use 39Ω in this application.
Note 4. Some versions may use 33K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ 1A	670VCT @ .048A	125VAC @ .022A Tap @ 6.3V @ 3.8A	12.6VAC @ 2.4A	FT1141955					

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	20000			BPD-02	DD-203	BYB6S2	ED-02	DC522	5HK-S2	
C44	.1	200		P288N-1		BC2P1J		ACE401	2SE-P1	
C45	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C46	100			N750-SI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750 10%
C47	100			N750-SI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750 10%
C48	200			N750-SI200	TCN-200	C10T2U	TC7-200		5TCU-T2	N750 10%
C49	.05	200		BPD-05	DF-503	BC2S47J		ACE6147	2SE-S47	
C50	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C51	.05	200		BPD-05	DF-503	CUB2S5		GEM-215	2TM-S47	
C52	.05	400		BPD-05	DF-503	BC6S47J		ACE6147	4SE-S47	
C53	270			BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C54	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C55	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C56	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C57	4700					1R5D47			MS-247	10%
C58	4700	10				1R5D47			MS-247	10%
C59	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C60	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C61	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C62	.1	200		P288N-1		BC2P1J		ACE401	2SE-P1	
C63	100			N750-SI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C64	3900				DD-402	L10D39	ED-004	UC-524	5GA-D4	
C65	3900				DD-402	L10D39	ED-004	UC-524	5GA-D4	
C66	.05	400		BPD-05	DF-503	BC6S47J		ACE-6147	4SE-S47	
C67	3900					1R5D39	ED-004		MS-239	10%
C68	.1	200		P288N-1		BC2P1J		ACE-201	2SE-P1	
C69	270			SI270	D6-271	LT6T27	ED-270	UC-5327	5GA-T27	
C70	.22	400		P488N-22		BC6P22J		ACE6022	4SE-P22	
C71	.22	400		P488N-22		BC6P22J		ACE6022	4SE-P22	
C72	.22	400		P488N-22		BC6P22J		ACE6022	4SE-P22	
C73	1000	5000			DD60-102					Note 4
C74	1000	5000			DD60-102					Note 4
C75	47			N750-SI47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C76	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C77	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C78	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	Note 3

Note 1. Some versions may use 470MMF in this application.
Note 2. Some versions may use 10000MMF in this application.
Note 3. Not used in some versions.
Note 4. Some versions may use 2500MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	1/2	RV1141972					Loudness, Tap @ 200K
B	Switch							
R2	500K	1/2	RV1141971					Treble, Tap @ 250K
R3	1Meg	1/2	RV1141970					Bass
R4A	15K	1/2	RV1021708	AB-20	A47-15K-S①	B11-118	TA153L	Bias Adjust
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R5A	5000Ω	1/2	RV1121820	AB-10 ①	A47-5000-S①	B11-114	TA53L	AM Meter
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R6A	2000Ω	1/2	RV121821	AB-6 ①	A47-2000-S①	B11-110	SU-8 ①	FM Meter
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R7A	5000Ω	1/2	RV1121910	AB-10 ①	A47-5000-S①	B11-114	TA53L	Auto. Noise Gate Adj.
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R8A	2Meg	1/2	RV1121819	AB-75 ①	A47-2Meg-S①	B11-139	PTA26L	AFC Adjust
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R9A	500Ω	1/2	RV1021709	AB-4 ①	A47-500-S①	B11-103	PTA52L	Hum Adjust
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R10	15K	1/2	RV1021725					Balance

① Enlarge mounting hole to 3/8" when replacing original with bushing type control.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4100Ω CT	16Ω Tap @ 8Ω	FT1141956	Z1401 ①		A-3851 ①			① Use Orig. Shields

COILS (RF-IF)

ITEM No.	USE	Harman-Kardon PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil				4584	.24 Microhenry; IRC Part #CLA
L2	RF Choke					3.3 Microhenries; IRC PART #CLA
L3	FM RF Coil	GL781543				
L4	FM Mixer Coil	GL781543				
L5	FM Osc. Coil	GL1122007				
L6	Cathode Choke		19-1000	BC-561	4602	1 Microhenry, IRC part #CLA
L7	RF Choke					3.3 Microhenries, IRC part #CLA
L8	Loop Stick	GL1141991		BC-418		
L9	AM RF Trans.	GT1121845				
L10	AM Osc. Coil	GL1121988				
L11	1st FM IF	GT1292108A	16-3490		1463-PC	
L12	1st AM IF	GT782122A	16-6780	BC-356	13-PC1	
L13	2nd FM IF	GT1292109A	16-3490		1463-PC	
L14	2nd AM IF	GT782122A	16-6780	BC-357	13-PC2	
L15	3rd FM IF	GT1292110	16-3490		1463-PC	
L16	FM Limiter	GT1292111	16-3490		1463-PC	
L17	FM Discr.	GT1292112A	17-3491		1464-PC	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	150MMF, 150MMF, 47K		Aerovox	PA-98
				Centralab	PC-51
				Cornell-Dubilier	111TM2
				Erie	1403-02
				Sprague	D-2

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.056A	Z1121908	1003A	RS075	75	
M2	.002A	Z1021726	1159	CR20	10	

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Harman-Kardon PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	2/10A 125V S/B			313.200 (3AG 2/10A 125V S/B)	357001	MDL 2/10	4A05

MISCELLANEOUS

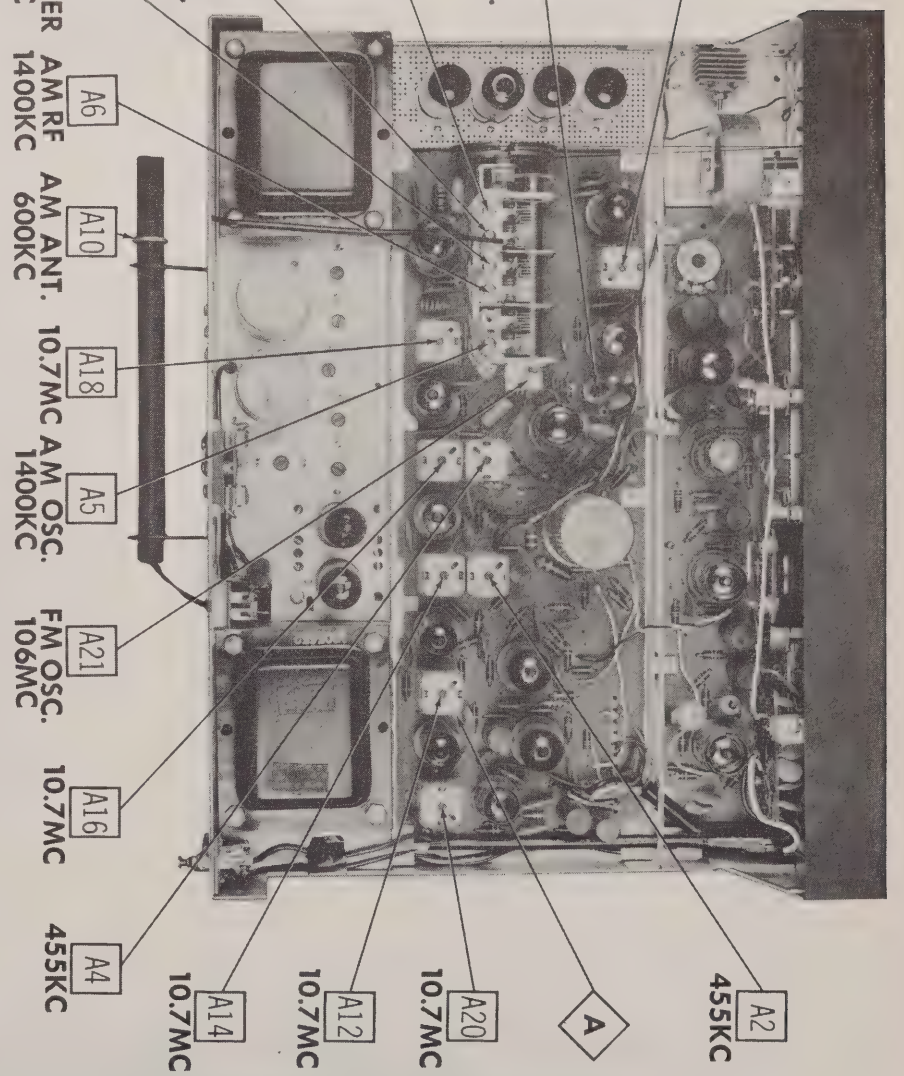
ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M4	Pilot Lamp		#1847
M5	Pilot Lamp		#1847
M6	Tuning Cap	JV1121844	AM-FM (6 Gang)
M7	Switch		Rumble Filter (Slide Type DPDT)
M8	Switch		Speaker Selector (Slide Type DPDT)
M9	Switch	P1141973	Function (Rotary Wafer Type)
M10	Switch	ER1141974	Contour (Rotary Wafer Type)
M11	Meter	Z1041686	Tuning Indicator

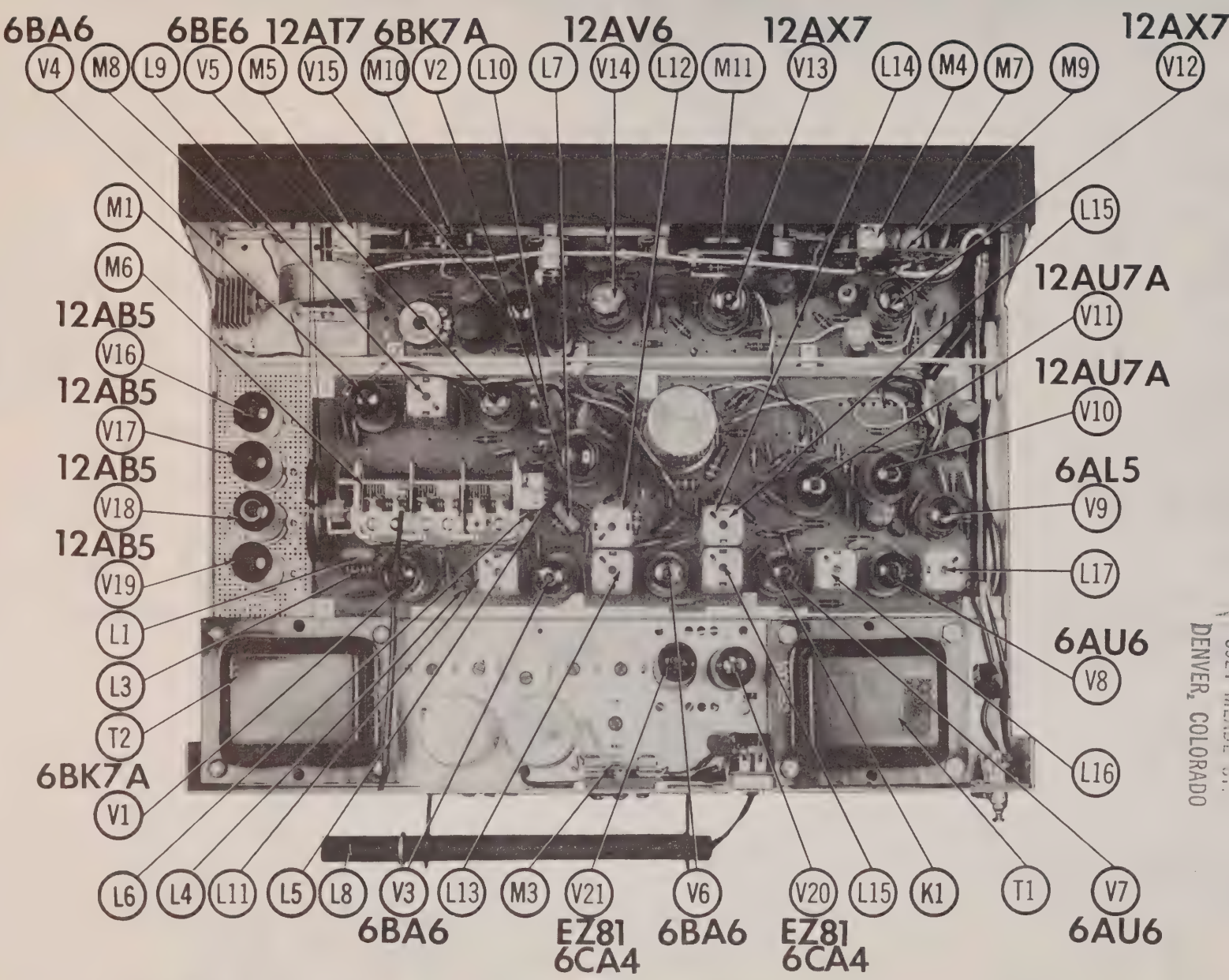
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	P20778	
Knob	P22783	
Dial Glass Ass'y.	P1141962	
Pointer	P1141963	

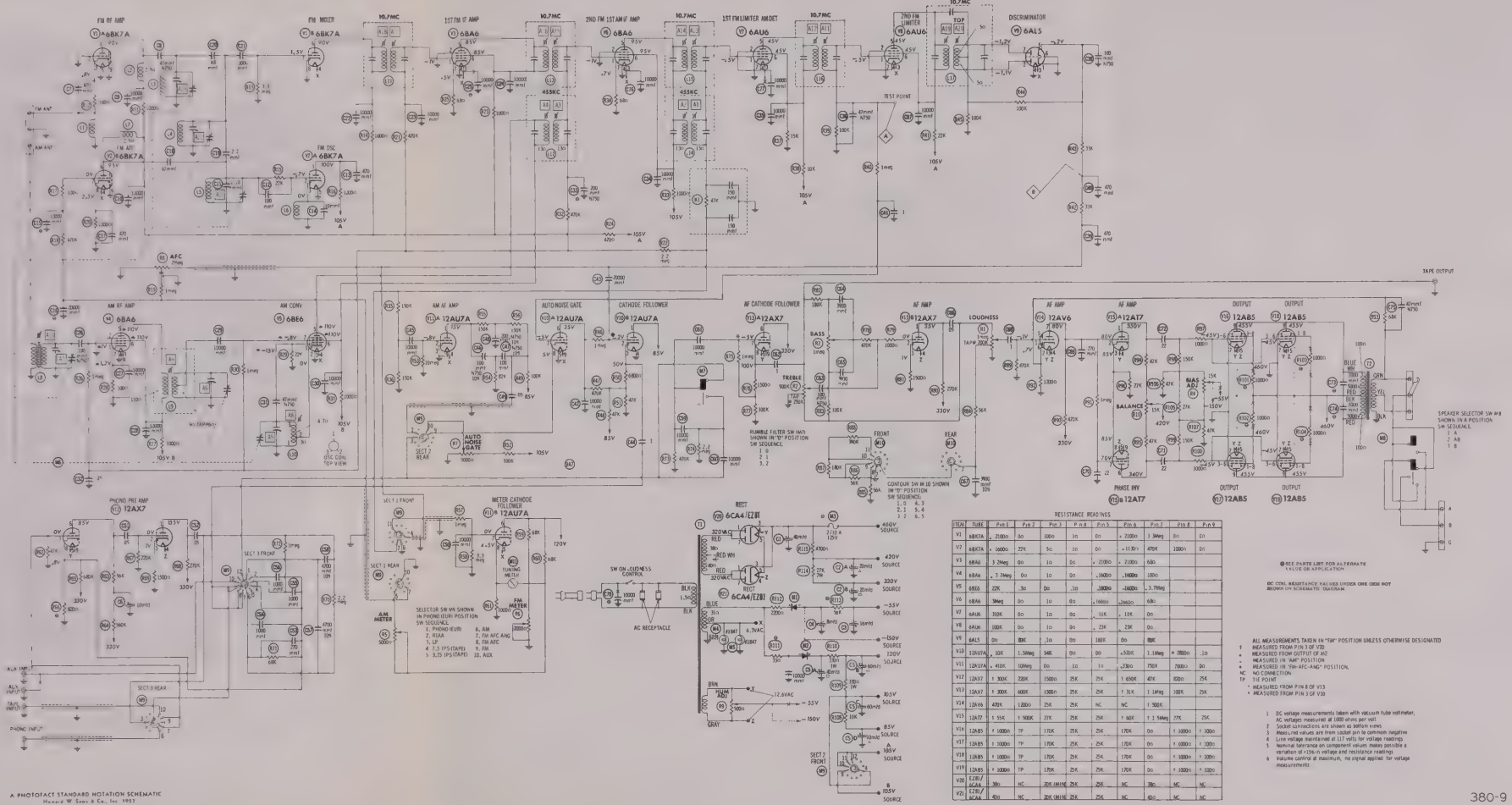
CHASSIS TOP VIEW ALIGN. IDENTIFICATION





CHASSIS TOP VIEW — TUBE-INDUCTOR — MISCELLANEOUS IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	▲ 21000	0Ω	1000	1Ω	0Ω	▲ 21000	3.3Meg	0Ω	0Ω
V2	6BK7A	▲ 16000	22K	5Ω	1Ω	0Ω	▲ 11300	470K	1000Ω	0Ω
V3	6BA6	▲ 3.2Meg	0Ω	1Ω	0Ω	▲ 2700Ω	▲ 2100Ω	68Ω		
V4	6BA6	▲ 3.7Meg	0Ω	1Ω	0Ω	▲ 360KΩ	▲ 160KΩ	100Ω		
V5	6BE6	22K	3Ω	0Ω	1Ω	▲ 160KΩ	▲ 160KΩ	▲ 3.7Meg		
V6	6BA6	3Meg	0Ω	1Ω	0Ω	▲ 160Ω	▲ 360Ω	68Ω		
V7	6AU6	310K	0Ω	1Ω	0Ω	11K	▲ 11K	0Ω		
V8	6AU6	100K	0Ω	1Ω	0Ω	22K	22K	0Ω		
V9	6AL5	0Ω	82K	1Ω	0Ω	160K	0Ω	82K		
V10	12AU7A	▲ 10K	▲ 1.5Meg	540K	0Ω	0Ω	▲ 510K	▲ 1.1Meg	▲ 2800Ω	1Ω
V11	12AU7A	▲ 410K	10Meg	0Ω	1Ω	1Ω	▲ 73KΩ	750K	7000Ω	0Ω
V12	12AX7	▲ 300K	220K	1500Ω	25K	25K	▲ 1.65M	47K	680Ω	25K
V13	12AX7	▲ 300K	600K	1500Ω	25K	25K	▲ 1M	▲ 1Meg	100K	25K
V14	12AV6	470K	1.8MΩ	25K	25K	NC	NC	▲ 500K		
V15	12AT7	▲ 55K	▲ 900K	27K	25K	25K	▲ 60K	▲ 1.5Meg	27K	25K
V16	12AB5	▲ 1000Ω	TP	170K	25K	25K	170K	0Ω	▲ 1000Ω	▲ 1000Ω
V17	12AB5	▲ 1000Ω	TP	170K	25K	25K	170K	0Ω	▲ 1000Ω	▲ 1000Ω
V18	12AB5	▲ 1000Ω	TP	170K	25K	25K	170K	0Ω	▲ 1000Ω	▲ 1000Ω
V19	12AB5	▲ 1000Ω	TP	170K	25K	25K	170K	0Ω	▲ 1000Ω	▲ 1000Ω
V20	6CA4/EZ81	38Ω	NC	220K (MIN)	25K	25K	NC	38Ω	NC	NC
V21	6CA4/EZ81	42Ω	NC	220K (MIN)	25K	25K	NC	42Ω	NC	NC

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
1 MEASURED FROM PIN 3 OF V3D
▲ MEASURED FROM OUTPUT OF A2
- MEASURED IN "AM" POSITION
● MEASURED IN "FM-AFC-ANG" POSITION.
NC NO CONNECTION
TP T/E POINT
* MEASURED FROM PIN 8 OF V13
* MEASURED FROM PIN 3 OF V3D

1 DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2 Socket connections are shown as bottom views
3 Measured values are from socket pin to common negative
4 Line voltage maintained at 117 volts for voltage readings
5 Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6 Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Treble to extreme clockwise position.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to AM RF stator lug on tuning gang. Low side to chassis.	455KC (400~ Mod.)	AM	1600KC	AC VTVM across speaker terminals	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	High side to AM antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9 A10	Adjust for maximum deflection. Repeat step 2.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (Unmod.)	FM (AFC Off)	Point of non-interference.	DC probe to point (A). Common to chassis.	A11, A12, A13, A14, A15, A16, A17, A18	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A19, A20	Detune A20. Adjust A19 for maximum deflection. Adjust A20 for zero reading with equal positive and negative deflection on either side of correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (450KC Swp.)	FM (AFC Off)	Point of non-interference.	Vert. amp. thru 1Meg to point (A). Low side to chassis.	A11, A12, A13, A14, A15, A16, A17, A18	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. amp. thru 1Meg to point (B). Common to chassis.	A19, A20	Adjust A20 so that 10.7MC occurs at center of crossover lines similar to Fig. 2. Adjust A19 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM (AFC Off)	106MC	DC probe to point (A). Common to chassis.	A21, A22 A23	Adjust for maximum deflection.
7.	"	"	90MC	"	90MC	"	L5, L4 L3	Adjust for maximum deflection by compressing or expanding coil turns. Repeat steps 6 & 7.

FIG. 1

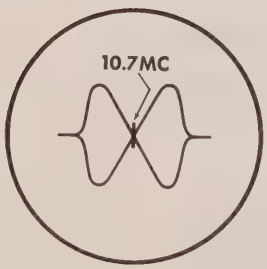
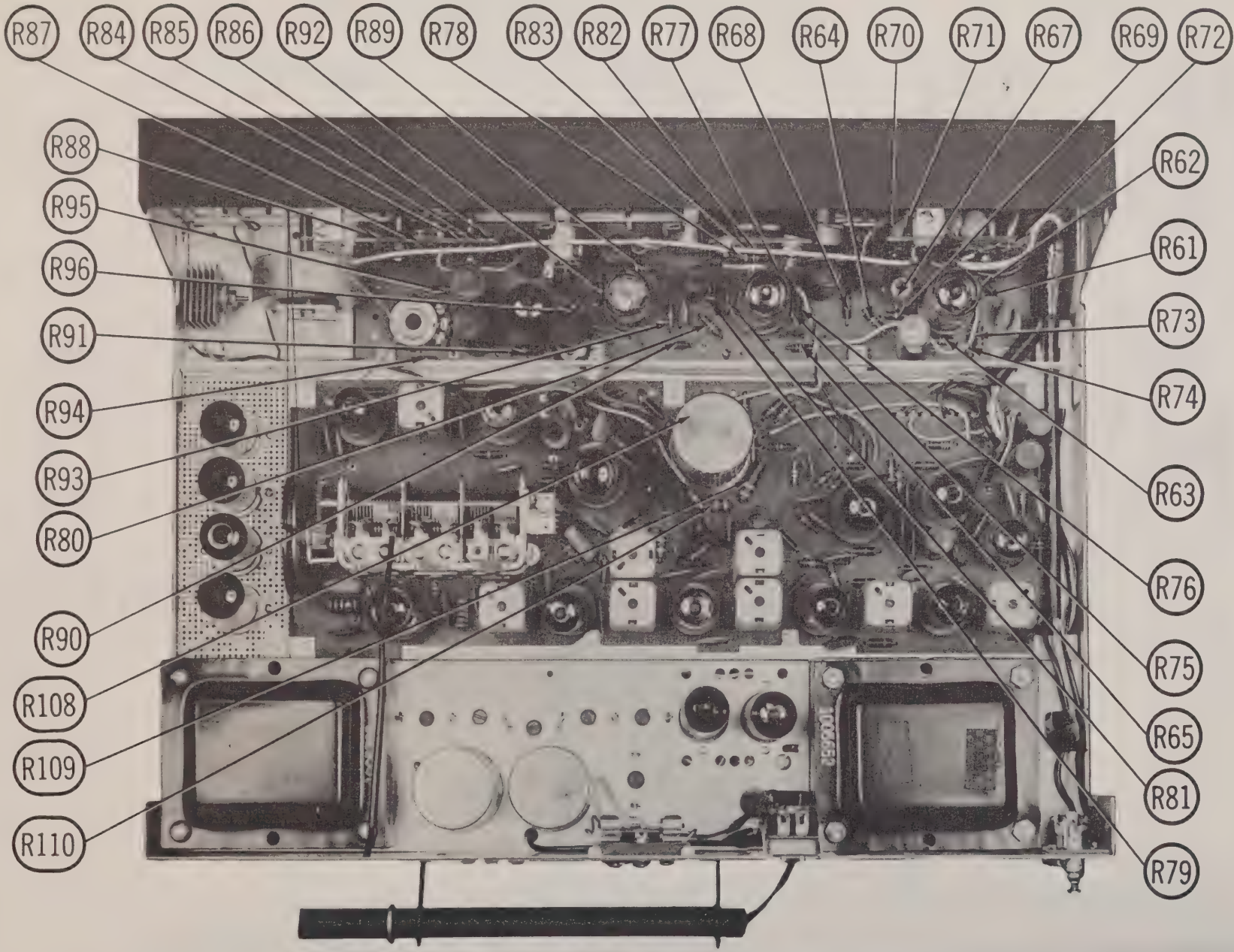


FIG. 2



CHASSIS TOP VIEW — RESISTOR IDENTIFICATION

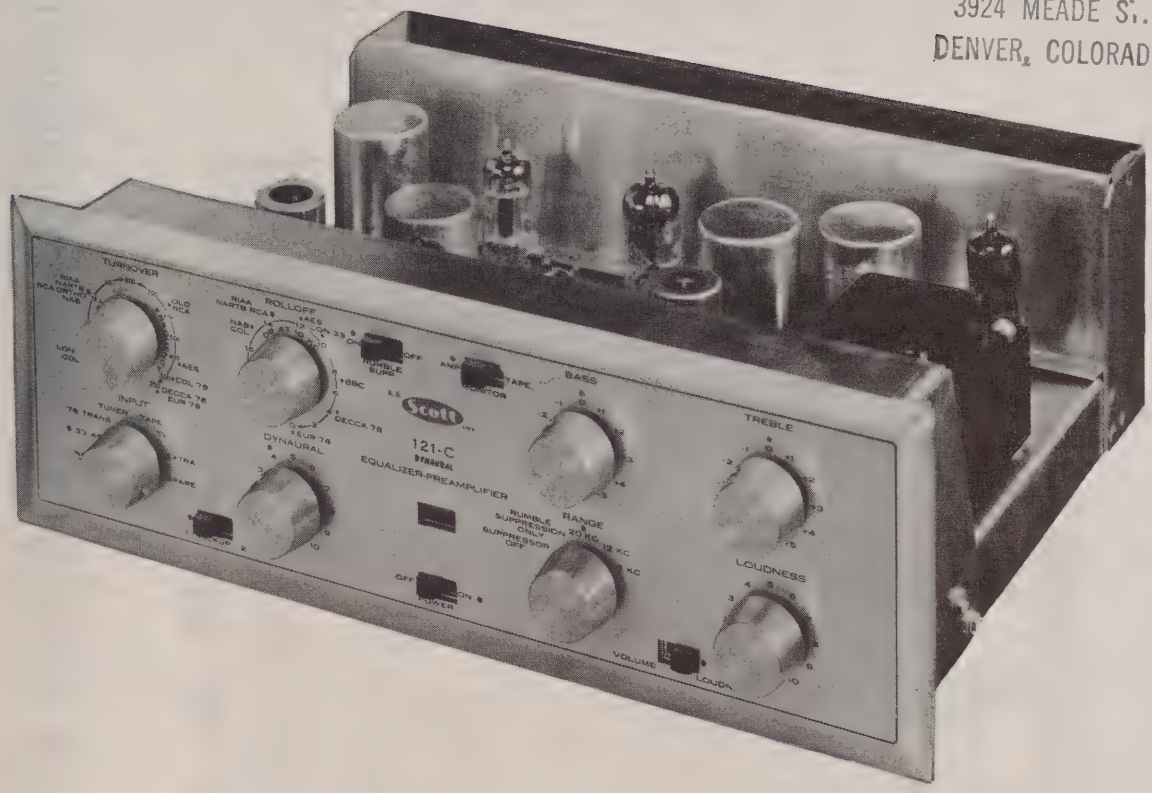
PHOTOFACT* Folder

*TRADE MARK

H. H. SCOTT
MODEL 121-C

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

H. H. SCOTT
MODEL 121-C



H. H. SCOTT
MODEL 121-C

TRADE NAME	H. H. Scott Model 121-C
MANUFACTURER	Hermon Hosmer Scott, Inc., 111 Powdermill Road, Maynard, Mass.
TYPE SET	AC Operated 9 Channel Equalizer Preamplifier
TUBES (Seven)	Types 12AU7 Preamp.-AF Amp., 12AX7 AF Amplifier, 6AV6 Bias Rect. Amp.-Bias Rect., 12AU7 Hi Freq. Gate, 12AU7 Lo Freq. Gate, 12AX7 AF Amp.-Cath. Follower, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .26 Amp. @ 117 Volts AC (25 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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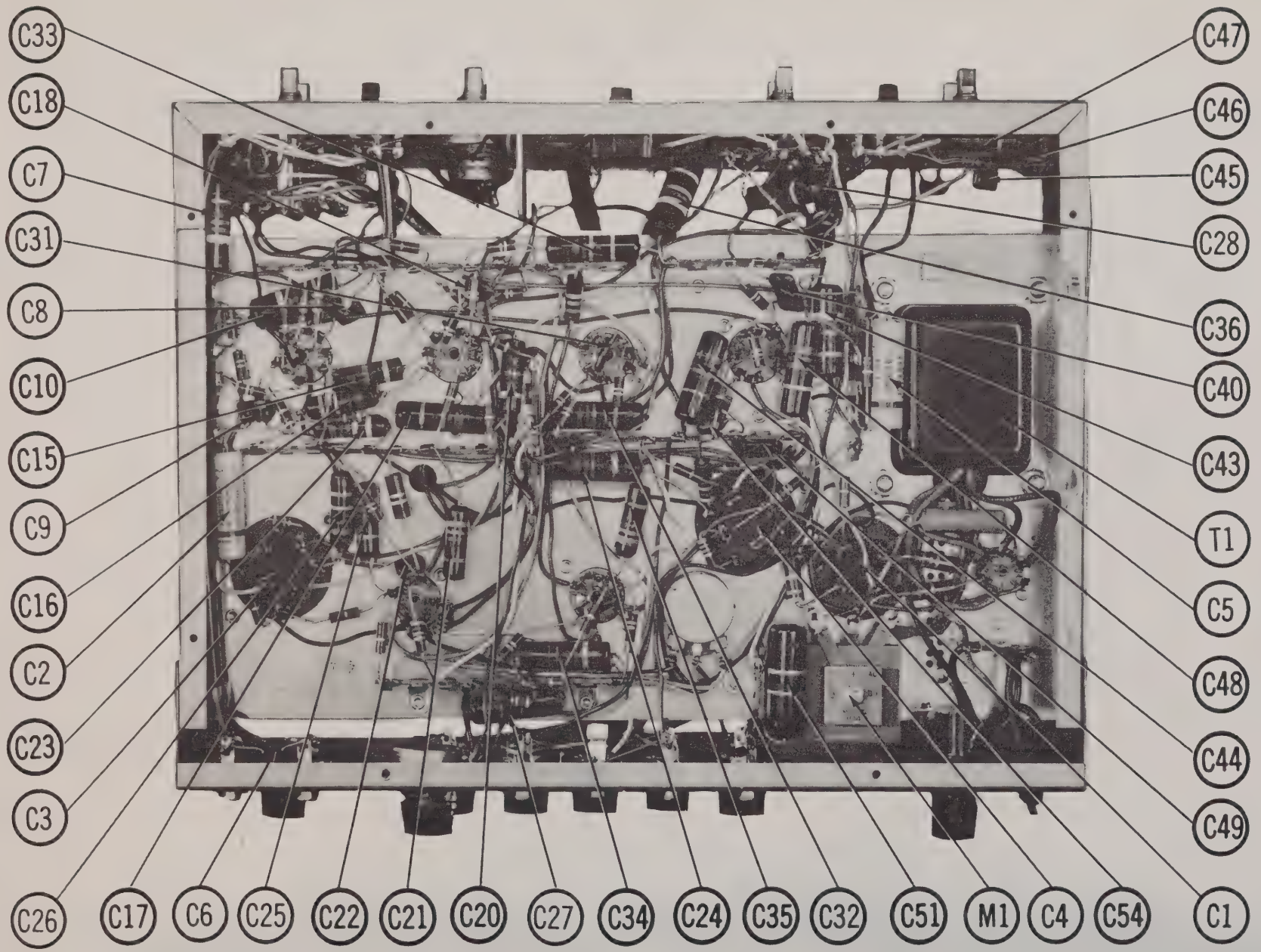
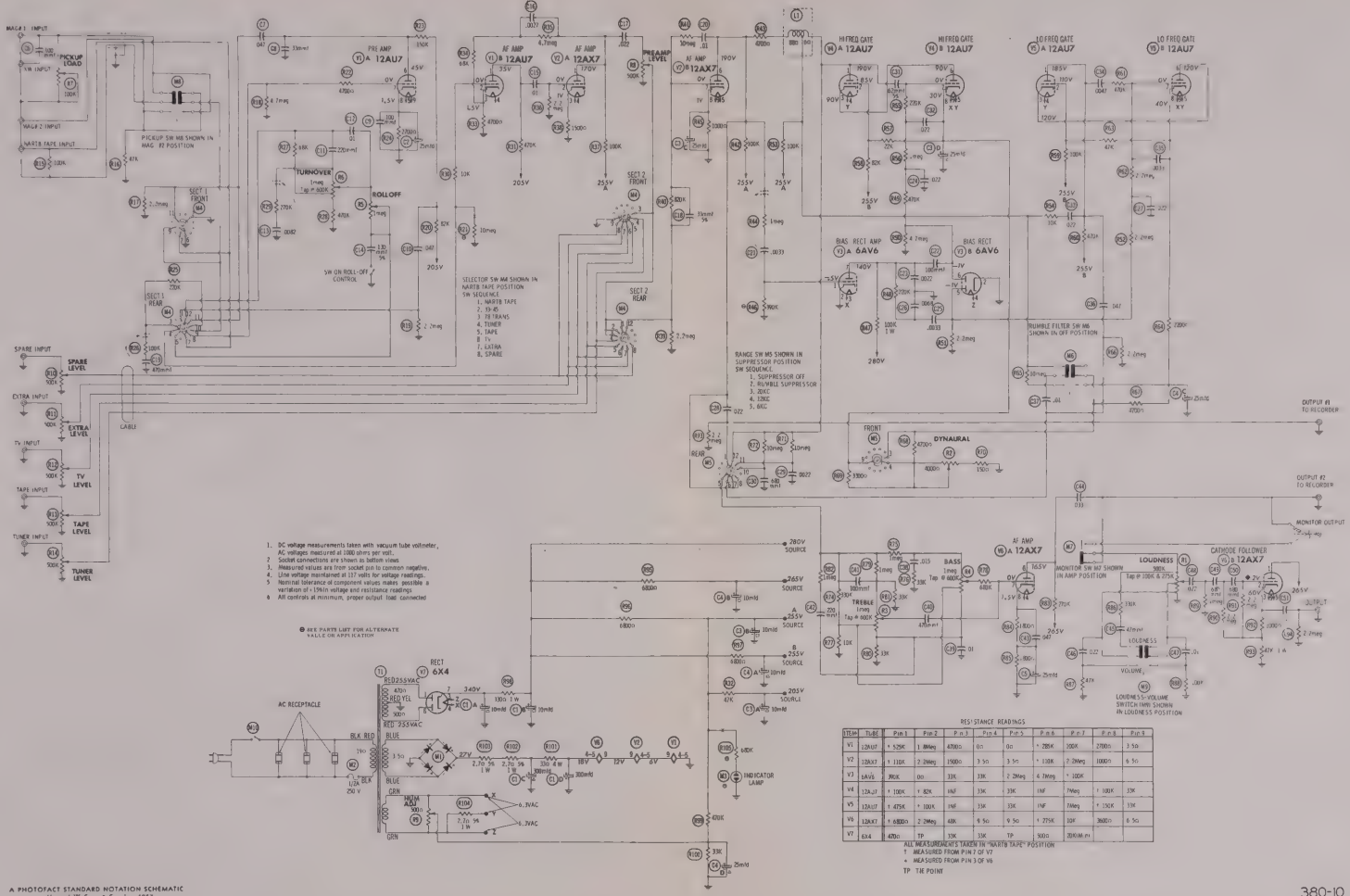


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

H. H. SCOTT
MODEL 121-C



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings
6. All controls at minimum, proper output load connected

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

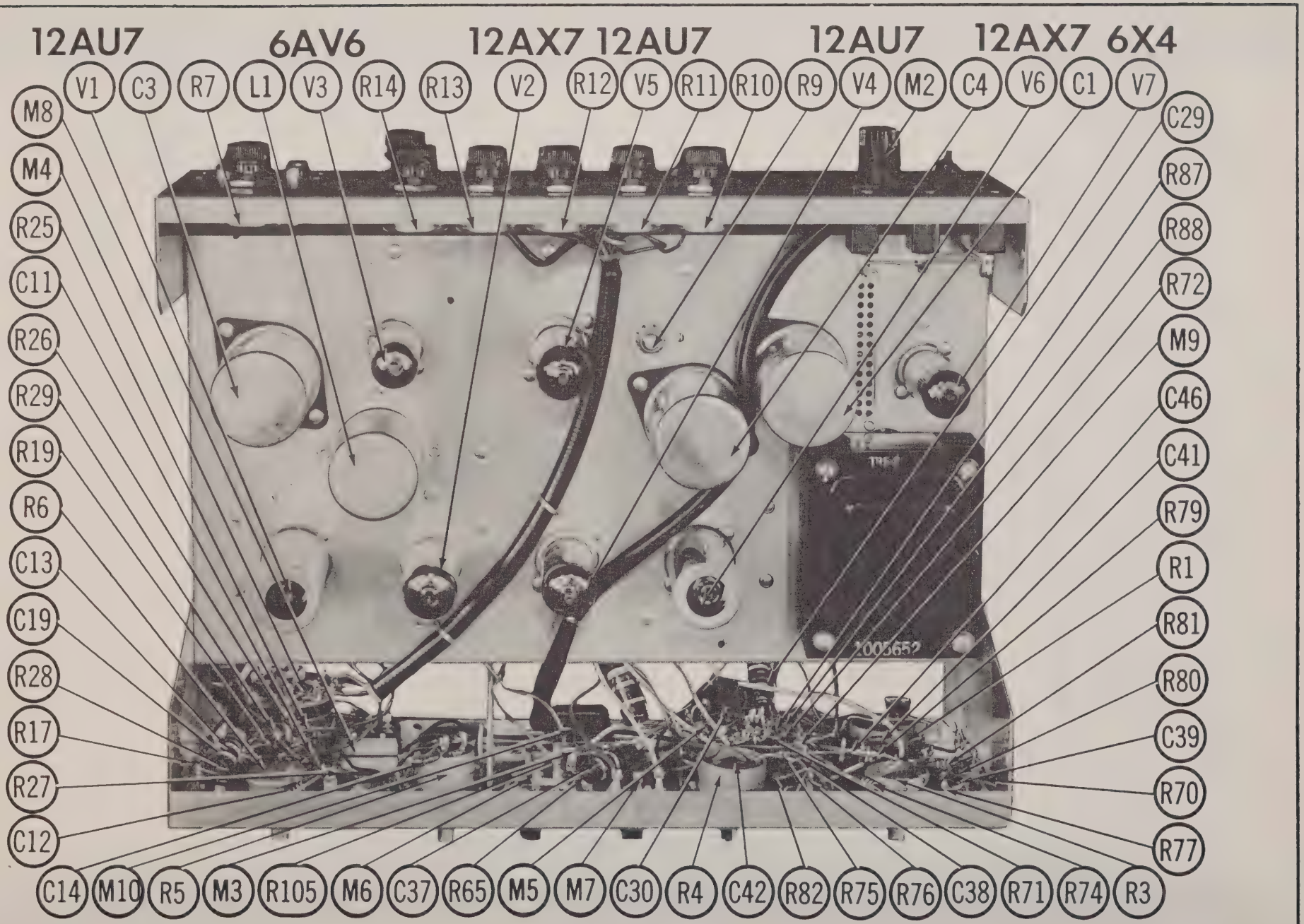
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	† 525K	1.8Meg	470Ω	0Ω	0Ω	* 285K	100K	270Ω	3.5Ω
V2	12AX7	† 110K	2.2Meg	150Ω	3.5Ω	3.5Ω	* 110K	2.2Meg	100Ω	6.5Ω
V3	6AV6	90K	0Ω	33K	33K	2.2Meg	4.7Meg	* 100K		
V4	12AU7	† 100K	* 82K	INF	33K	33K	INF	7Meg	† 100K	33K
V5	12AU7	† 475K	* 100K	INF	33K	33K	INF	7Meg	† 150K	33K
V6	12AX7	† 680Ω	2.2Meg	68K	9.5Ω	9.5Ω	* 275K	10K	360Ω	6.5Ω
V7	6X4	470Ω	TP	33K	33K	TP	500Ω	20Ω		

ALL MEASUREMENTS TAKEN IN "NARTB TAPE" POSITION
† MEASURED FROM PIN 7 OF V7
* MEASURED FROM PIN 3 OF V6
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

380-10



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamp. -AF Amp.	12AU7	
V2	AF Amplifier	12AX7	
V3	Bias Rect. Amp. - Bias Rectifier	6AV6	
V4	Hi Freq. Gate	12AU7	
V5	Lo Freq. Gate	12AU7	
V6	AF Amp. -Cath. Follower	12AX7	
V7	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲10	350							R2447 *
B	■10	350							
C	▲300	25							
D	300	25							
C2	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C3A	▲10	450		AFH4-63	D0880		TMQ-72	Q-295	TVL-4711.6
B	■10	450							
C	25	25							
D	▲25	25							
C4A	▲10	450		AFH4-63	D0880		TMQ-72	Q-295	TVL-4711.6
B	■10	450							
C	25	25							
D	▲25	25							
C5	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205

* NON CATALOG ITEM

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	100			1468-0001	D6-101	5W5T1	ED-100	UC-531	5GA-T1	
C7	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C8	33			1468-000033	D6-330	5W5Q33	ED-33	UC-5433	5GA-Q33	
C9	100			1468-0001	D6-101	5W5T1	ED-100	UC-531	5GA-T1	
C10	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C11	220			1468-00022	D6-221	5W5T22	ED-220	UC-5322	5GA-T22	
C12	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C13	.0082	400								
C14	130			1469-00013		22R5T13				5%
C15	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C16	.0027	400			D6-272		GP-2000			
C17	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C18	33			1469-000033		22R5Q33			MS-333	5%
C19	470			1468-00047	D6-471	5W5T47	ED-470	UC-5347	5GA-T47	
C20	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C21	.0033	400		BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C22	100			1468-0001	D6-101	5W5T1	ED-100	UC-531	5GA-T1	
C23	.0022	400		BPD-0022	D6-222	CUB6D22	GP-2200	GEM-6222	6TM-D22	
C24	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C25	.0033	400		BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C26	.0068	400			D6-682	CUB6D68	GP-6800			
C27	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C28	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C29	.0022	400		BPD-0022	D6-222	CUB6D22	GP-2200	GEM-6222	6TM-D22	
C30	680			1467-00068	D6-681	1W5T68	ED-680	UC-5368	5GA-T68	
C31	62			1469-000062		22R5Q62	TCO-62		MS-462	5%
C32	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C33	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C34	.0047	400		BPD-0047	D6-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C35	.0033	400		BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C36	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C37	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C38	.015	400		BPD-015	DD16-153	CUB6S15	ED-015	GEM-6115	6TM-S15	
C39	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C40	470			1467-00047	D6-471	5W5T47	ED-470	UC-5347	5GA-T47	
C41	100			1468-0001	D6-101	5W5T1	ED-100	UC-531	5GA-T1	
C42	220			1468-00022	D6-221	5W5T22	ED-220	UC-5322	5GA-T22	
C43	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C44	.033	400		BPD-03	DF-303	CUB6S33		GEM-4133	4TM-S33	
C45	47			1468-000047	D6-470	5W5Q47	ED-47	UC-5447	5GA-Q47	
C46	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-6122	6TM-S22	
C47	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C48	.022	400		BPD-02	DD-203	CUB4S22	GP-02	GEM-6122	4TM-S22	
C49	680			1467-00068	D6-681	1W5T68	ED-680	UC-5368	5GA-T68	
C50	680			1467-00068	D6-681	1W5T68	ED-680	UC-5368	5GA-T68	
C51	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	RCV-500K-TT-3F	ABT-160		Q18-133XX	UDT-283	Loudness, Tap @ 100K & 275K
B	Shaft			AK-3		Not Req.	Not Req.	
R2	4000Ω	½	RCV-4000-3F	B-12		Q17-114		DYNAURAL
R3	1Meg	½	RCV-1MT-3F	BT-71		Q19-137X	UT-443	Treble, Tap @ 600K
R4	1Meg	½	RCV-1MT-3F	BT-71		Q19-137X	UT-443	Bass, Tap @ 600K
R5A	1Meg	½	RCV-1M-3-SWR					Roll-Off
B	Switch							
R6	1Meg	½	RCV-1MT-3F	BT-71		Q19-137X	UT-443	Turnover, Tap @ 600K
R7A	100K	½	RCV-100K-3S	B-40	A47-100K-S	Q11-128	U41	Pick Up Load
B	Shaft			Not Req.	RS-2	PQ	Not Req.	
R8A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Preamp Level
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R9A	500Ω	½	RCV-500-S	AB-4	A47-500-S	Q11-103	U2	Hum Adjust
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R10A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Level (Spare)
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R11A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Level (Extra)
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R12A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Level (TV)
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R13A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Level (Tape)
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R14A	500K	½	RCV-500K-3	B-60	A47-500K-Z	Q13-133	U48	Level (Tuner)
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA H. H. SCOTT PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R15	100K			BTS-100K	
R16	47K			BTS-47K	
R17	2.2Meg			BTS-2.2Meg	
R18	4.7Meg			BTS-4.7Meg	
R19	2.2Meg			BTS-2.2Meg	
R20	82K			BTS-82K	
R21	10Meg			BTS-10Meg	Note 1
R22	4700Ω			BTS-4700	
R23	150K			BTS-150K	
R24	2700Ω			BTS-2700	
R25	220K			BTS-220K	
R26	100K			BTS-100K	
R27	68K			BTS-68K	
R28	470K			BTS-470K	
R29	270K			BTS-270K	
R30	10K			BTS-10K	
R31	470K			BTS-470K	
R32	47K			BTS-47K	
R33	4700Ω			BTS-4700	
R34	68K			BTS-68K	
R35	4.7Meg			BTS-4.7Meg	
R36	2.2Meg			BTS-2.2Meg	
R37	100K			BTS-100K	
R38	1500Ω			BTS-1500	
R39	2.2Meg			BTS-2.2Meg	
R40	820K			BTS-820K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	H. H. SCOTT PART No.	IRC PART No.	
R41	10Meg			BTS-10Meg	
R42	100K			BTS-100K	
R43	4700Ω			BTS-4700	
R44	1Meg			BTS-1Meg	
R45	1000Ω			BTS-1000	
R46	390K			BTS-390K	Note 2
R47	100K	1		BTA-100K	
R48	220K			BTS-220K	
R49	470K			BTS-470K	
R50	4. 7Meg			BTS-4. 7Meg	
R51	2. 2Meg			BTS-2. 2Meg	
R52	2. 2Meg			BTS-2. 2Meg	
R53	100K			BTS-100K	
R54	10K			BTS-10K	
R55	220K			BTS-220K	
R56	1Meg			BTS-1Meg	
R57	22K			BTS-22K	
R58	82K			BTS-82K	
R59	100K			BTS-100K	
R60	470K			BTS-470K	
R61	470K			BTS-470K	
R62	2. 2Meg			BTS-2. 2Meg	
R63	47K			BTS-47K	
R64	2200Ω			BTS-2200	
R65	10Meg			BTS-10Meg	
R66	2. 2Meg			BTS-2. 2Meg	
R67	4700Ω			BTS-4700	
R68	4700Ω			BTS-4700	
R69	3300Ω			BTS-3300	
R70	150Ω			BTS-150	
R71	10Meg			BTS-10Meg	
R72	10Meg			BTS-10Meg	
R73	2. 2Meg			BTS-2. 2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	H. H. SCOTT PART No.	IRC PART No.	
R74	330K			BTS-330K	
R75	1Meg			BTS-1Meg	
R76	33K			BTS-33K	
R77	10K			BTS-10K	
R78	680K			BTS-680K	
R79	1Meg			BTS-1Meg	
R80	33K			BTS-33K	
R81	33K			BTS-33K	
R82	1Meg			BTS-1Meg	
R83	270K			BTS-270K	
R84	1800Ω			BTS-1800	
R85	1800Ω			BTS-1800	
R86	330K			BTS-330K	
R87	47K			BTS-47K	
R88	100K			BTS-100K	
R89	1Meg			BTS-1Meg	
R90	2. 2Meg			BTS-2. 2Meg	
R91	2. 2Meg			BTS-2. 2Meg	
R92	1000Ω			BTS-1000	
R93	47K	①		BTA-47K	
R94	2. 2Meg			BTS-2. 2Meg	
R95	6800Ω			BTS-6800	
R96	6800Ω			BTS-6800	
R97	6800Ω			BTS-6800	
R98	3300Ω	1		BTA-3300	
R99	470K			BTS-470K	
R100	33K			BTS-33K	
R101	33Ω	4			
R102	2. 7Ω 5%	1			
R103	2. 7Ω 5%	1			
R104	2. 7Ω 5%	1			
R105	680K			BTS-680K	Note 1

Note 1. Not used in some versions.

Note 2. Some versions may use 220K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	H. H. SCOTT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .26A	500VCT ⓐ .010A	6. 3VAC 1. 3A	25VAC ⓐ .280A	TR-5-2					

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		H. H. SCOTT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Tone Choke					

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	H. H. SCOTT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	. 280A		1016	B1B	604B	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			H. H. SCOTT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	½A 250V			312. 500 (3AG ½A 250V)	342001	AGC½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	H. H. SCOTT PART No.	NOTES
M3	Indicator Lamp		Neon (Not used in some versions)
M4	Switch		Selector (Rotary Wafer Type)
M5	Switch		Range (Rotary Wafer Type)
M6	Switch		Rumble Supp. (Slide Type DPST)
M7	Switch		Monitor (Slide Type DPST)
M8	Switch		Pickup (Slide Type DPST)
M9	Switch		Volume-Loudness (Slide Type DPST)
M10	Switch		Power-On-Off (Toggle Type)

PHOTOFACT* Folder

*TRADE MARK

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SILVERTONE MODELS 8070, 8072 (Ch. 528.58010, 528.58011, 528.58030, 528.58031, 528.59040, 528.59041, 528.59060, 528.59061)

GENERAL INFORMATION

Silvertone Models 8070 and 8072 are electrically alike. The major difference between the two models is mechanical. Model 8070 is a single speed and Model 8072 is two speed.

Models 8070 and 8072 are designed to record and play two tracks of material on standard width recording tape. This doubles the recording and playing time without loss of quality or frequency response. Recordings can be made from a phonograph, radio or television receiver, in addition to those made directly from the microphone.

Model 8070 has one speed, 7 1/2" per second, while Model 8072 has two speeds, 3 3/4" and 7 1/2" per second. Using both tracks, the recording times are as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour
7" (1200 ft.)	2 hours	1 hour

Models 8070 and 8072 are designed to operate on 60 cycle, 110-120 volts, AC supply only. Before connecting to a supply line, be absolutely certain that it agrees with the above specifications.

SUPPLIED by:

SEARS, ROEBUCK & CO.
925 S. HOMAN STREET
CHICAGO 7, ILLINOIS

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FOLDER 11

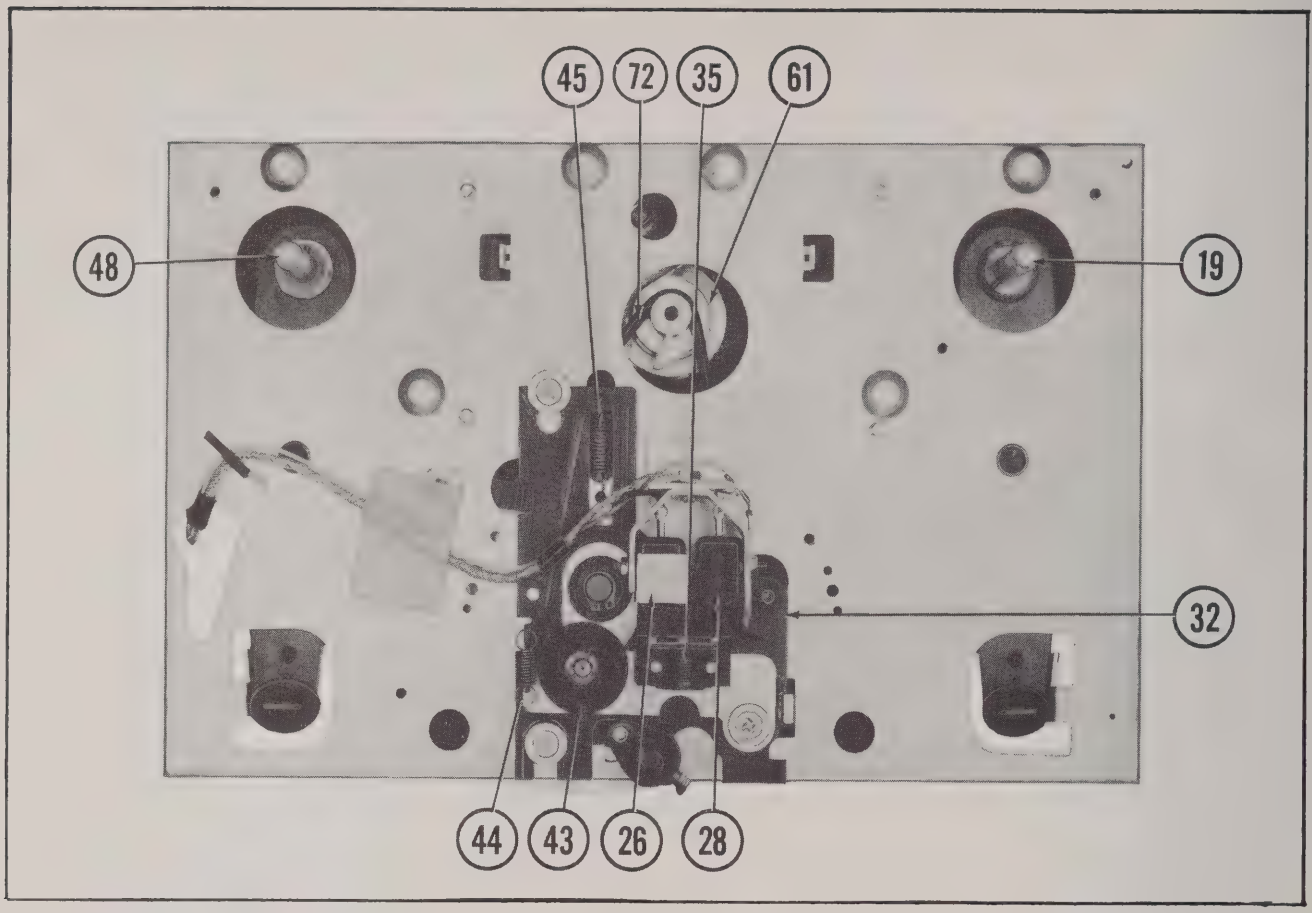

FIG. 1

SPECIFICATIONS

Fast Forward And Fast Rewind Speed:

5" Reel, (600 ft.) 55 Seconds (Approx.)
7" Reel, (1200 ft.) 105 Seconds (Approx.)

Frequency Response:

3 3/4" speed — 65 to 6000 cycles per second
7 1/2" speed — 65 to 8500 cycles per second

Bias And Erase Frequency:

52.5KC

Bias Voltage:

Shure Head, 10 volts bias
Michigan Mag. Head, 20 volts bias

Power Output:

2 Watts undistorted
3 Watts maximum

Inputs:

Microphone, 1 Meg. impedance
Radio-Phone, .5 Meg. impedance

Outputs:

Two internal 5" speakers
External 3.2 ohm speaker
External-low impedance across 3.2 ohm voice coil for external speaker.
External high impedance for external amplifier or monitor in record or playback position.

Maximum Reel Size:

7" (1200 ft.)

OPERATING INSTRUCTIONS

Speed Control-

The operating speed setting is accomplished by placing the speed control button (1) in either the "Up" or "Down" position. "Up" for 3 3/4" per second and "Down" for 7 1/2" per second. (Model 8072 only).

CAUTION: NEVER operate this control unless the ON-OFF switch (12) is in the ON position.

Threading Tape-

1. Place a reel of tape on the right reel plate (9), and an empty reel on the left reel plate (9) making certain the reel slots engage the pins on the reel plates.

2. Turn the Play-Record control knob (5) in the center of the machine to the fully counterclock-wise position.

3. Unwind about 10" of tape from the reel. Hold

a section of the tape straight with both hands and insert the tape in the tape slot making certain that the dull coated side faces the rear of the recorder.

4. Insert the end of the tape into one of the three radial slots in hub of the take-up reel. Turn the reel several turns, clockwise, until the tape is secured to the reel and all slack is taken up between the reels.

To Record From Microphone-

1. Turn the recorder on by rotating the "ON"-OFF" control to the right. Allow about 30 seconds for the tubes to warm up.

2. Insert the microphone plug into the "Mike" jack.

3. Adjust the speed control knob (1) for the desired speed — 3 3/4" or 7 1/2" per second.

4. Push down on the Play-Record control knob (5) as far as it will go. Hold down and turn clockwise until it locks.

5. Hold the microphone away from your mouth about 6 to 12 inches and speak in a normal voice. DO NOT SHOUT. Adjust the volume control until the record level indicator flashes on the loudest sound.

NOTE: Correct volume level on recording is very important. Too weak a signal, which does not cause flashing on the recording level indicator, will result in weak playback and high background noise. Too strong a signal, which causes continuous flashing of the level indicator, will result in distortion during playback.

To Record From Radio-

Recordings from a radio may be made by one of these methods.

1. Through the microphone by pickup from the radio speaker:

Place the microphone about 6" to 12" in front of the radio speaker. Turn the radio volume control to a normal level. Setting it too high will cause distortion. Turn the radio tone control to treble or high. Set the recording level and record as under "To Record From Microphone."

2. Through a direct connection to the Radio speaker:

Make up a shielded cable with a two conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice coil terminals of the radio speaker and insert the plug into the "Radio-Phono" jack. Set the radio volume and tone controls as described above. Set the recording level and proceed as described under "To Record From Microphone".

3. Through a direct connection to the volume control of the radio:

Make up a shielded cable with a two conductor plug on one end. Connect the other end across the radio volume control. Insert the phone plug in the "Radio-Phono" jack. Set the recording level and proceed as described under "To Record from Microphone". The radio volume and tone controls do not affect this set up, consequently they may be set any place.

To Record From Record Player-

1. If the Record Player being used has a phone type plug on the pick-up leads, insert it into the "Radio-Phono" Jack. Set the recording level and proceed as listed under "To Record From Microphone".

2. If the Record Player has a standard pin type plug, which is more common, an adapter is needed. Insert the pin plug into the adapter and plug the adapter into the "Radio-Phono" jack.

To Record From Television Receiver-

Use one of the three methods described under "To Record From Radio".

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Dual Track Recording-

These recorders are designed to record and play on one-half the width of the tape at a time; thereby resulting in two track recording. To record on the other half of the tape remove the full reel from the takeup (left) side, turn reel over and place it on the feed (right) side. In playing or recording you may stop any place and reverse the reels to use the other track.

Fast Forward And Fast Rewind-

High speed forward or rewind operation may be obtained by pressing the desired knob (13) toward the head cover. This will wind the tape on the desired reel at a high speed as long as the knob is held in this position.

NOTE: Do not attempt fast forward or rewind with the Play-Record control on any setting except neutral position, as damage to the unit or tearing of the tape will result.

Braking-

This recorder contains an automatic brake mechanism giving more accurate tape control. To stop the tape at any time, when operating on fast forward or fast rewind, simply release the forward or rewind control. The tape will automatically come to a stop.

To Play A Recording-

1. Thread the tape as described under "Threading Tape".

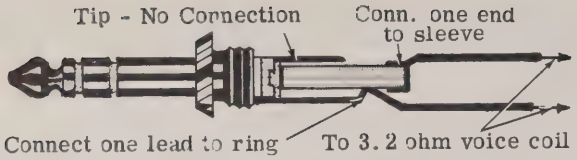
2. Turn play-record control (5) clockwise without depressing until it locks.

3. Adjust the "Volume" and "Tone" controls (12) to desired listening level.

To Use An External Speaker-

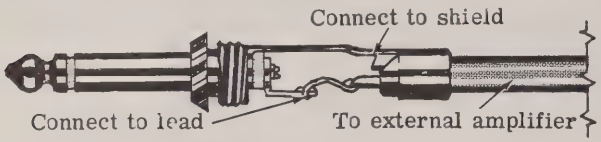
Plug external speaker through a three conductor plug into the "Output Jack". Connect the three conductor plug as shown in sketch.

CAUTION: Do not insert plug into recorder without external speaker attached.



To Use An External Amplifier-

Plug the external amplifier into the "Output Jack" through a two conductor plug connected as shown in sketch.



To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings to be edited should be limited to one track only.

1. Tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements can be inserted between selections, etc. Unused tape can be spliced for reuse.

2. For best results cut tape at a slight diagonal, joining ends together with a butt joint and fastening on the glossy side with splicing tape. Trim off any excessive width.

To Erase A Recording-

In the record position any recording on the tape is automatically erased before the new recording is put on the tape. Should it be desired to erase a recording without recording new material, follow the normal recording procedure, except set the volume control to the full counter-clockwise position.

ADJUSTMENTS

Spindle (19 And 48) End Play Adjustment-

The spindles should have from 1/32" to 1/16" of up and down movement. To adjust loosen set screw (65) on spindle to be adjusted and move the pulley (55) up or down as required until the correct end play is obtained.

Take-Up Lever Adjustment-

Spring (83) on the take-up lever (90) controls the timing of the left take-up reel holder (9). With the control knob (5) in the play back position, the take-up reel should start revolving at the same time or a little after the Pressure Roller (43) starts pulling the tape past the head (39).

Check adjustment by placing a fully loaded 7" reel on the take-up spindle. Rewind for about 10 seconds. Move the control knob (5) to the playback position and observe the action described above.

If adjustment is required, bend ear on take-up arm (85) in the position and direction indicated in sketch on exploded view. Care must be exercised when making this adjustment and repeated trials between bends should be made.

Take-Up And Feed Reel Drag-

When the control knob (5) is placed in the "Neutral" position the reels should stop promptly with a minimum of overrun. There should be no looping of the tape. With control knob (5) in the neutral position and without reels on the holders, they may revolve slightly, but once the reels are put in place they should not revolve.

Stops, labeled "C" and "D" on Figure 3B, located on baseplate (22) controls the above action. They regulate the amount of return that take-up arm (85) or rewind arm (52) makes after controls have been released; not sufficient return would cause continued Fast Rewind or Fast Forward operation, while too much return would not allow drive belts (88) or (59) to put a drag on the respective pulleys. Bend these stops carefully so as to obtain operation described above. Stop "C" controls the take-up side while stop "D" controls the rewind side.

Head Alignment Adjustment-

It is extremely important that the Head (39) be lined up perfectly with the tape. If not, the result will probably be low output, track overlap, or loss of high frequencies.

1. Chassis 567.58030, 528.58030 and 528.58010 (SHURE Head).

If the SHURE Head requires replacement, the complete assembly composed of the head and head holder should be replaced. The head holder is adjusted individually to the head and sealed at the factory. When installing head (39A) observe the following precautions:

HEAD HEIGHT: Place a .179" gauge (between 11/64" and 3/16") near the mounting bracket and between base plate (22) and bottom of head holder. Push down on head (39A) and tighten set screw (23). Remove gauge.

An alternate method of adjusting the head height when a gauge is not available is as follows:

(a) Remove the pressure shoe assembly (36) from the pressure bracket so the head can be observed through the opening in the pressure bracket.

(b) Align head (39A) so the bottom of the head opening is at the same level (or slightly higher) as the corresponding bottom of the opening of the pressure bracket.

(c) With the unit pulling tape, the tape should approach the take-up reel nearly centered between the flanges of the reel. If the tape runs against the bottom flange, it is an indication that the head is too low.

(d) Make "Output Response" adjustment as described in Section 3 below.

2. Chassis 567.58031, 528.58031 and 528.58011 (Michigan Magnetic Head)

On units using the Michigan Magnetic Head, a

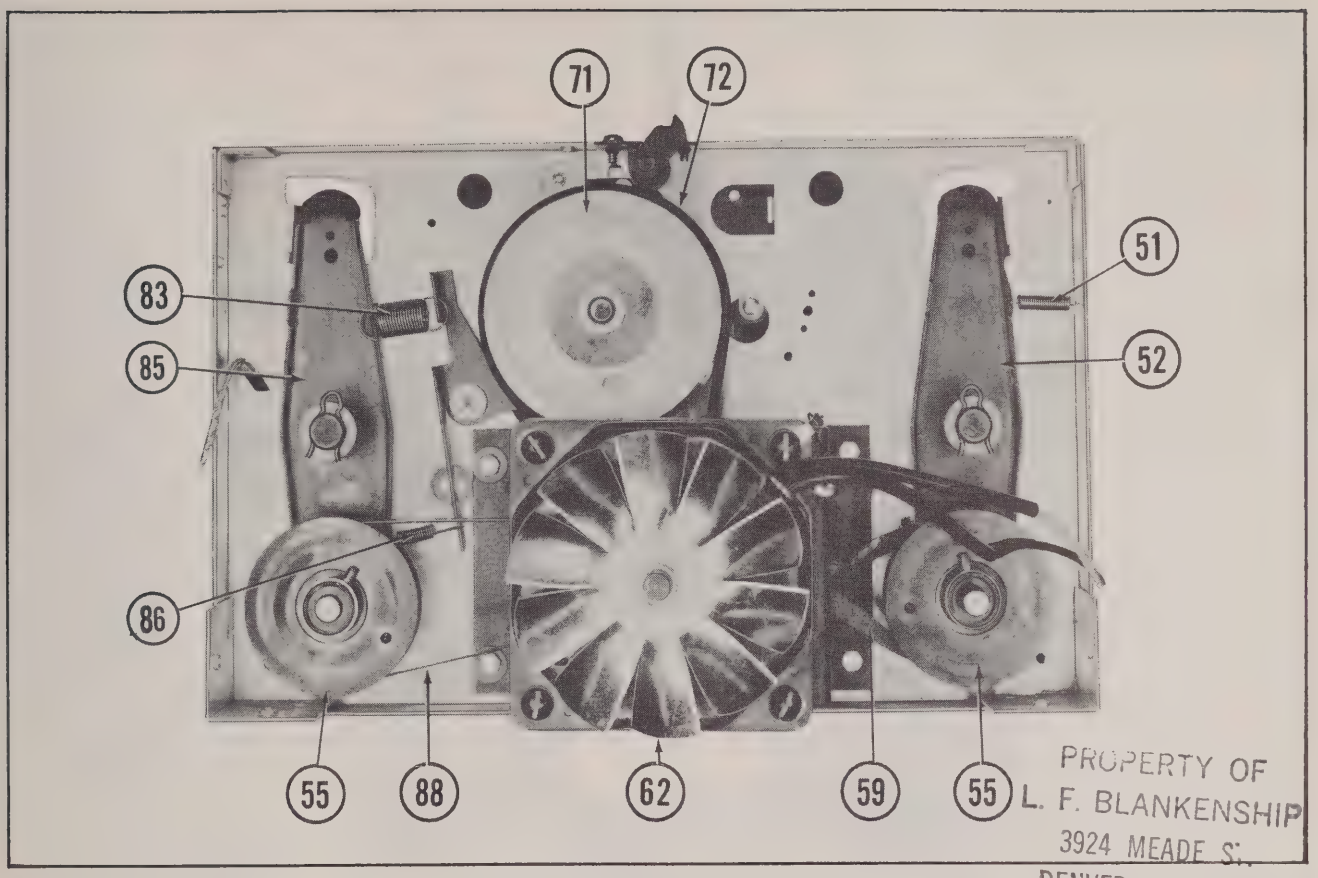


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FIG. 2

simple alignment procedure is as follows:

(a) Place a full reel of tape on the right hand spindle (19) and thread tape. See "Threading Tape".

(b) Pull tape tight against Heads (26) and (28) by rotating one reel while holding the other reel.

(c) Both heads should then be positioned so the top edge of the tape is exactly even with the bottom edge of the ground down "flat" section on the face of the heads.

(d) When in this position, both heads should also be perpendicular to the bracket vertically and horizontally.

(e) The faces of the heads should be in line with each other so as to present a flat surface to the tape, i.e. one head should not protrude further forward than the other.

3. Output Response

To make this adjustment, a tape on which a 3000 cycle note has been recorded by a unit known to be in good operating condition will be required.

Connect an output meter, or AC voltmeter, across the speaker voice coil of the unit to be adjusted. While playing back the 3000 cycle note tape, pivot head (39) back and forth on mounting screw (23) until maximum amplitude on output meter is achieved. Make certain that head height has not been changed.

If a 3000 cycle tape cannot be made, use a recording with high note content to make the adjustment described above.

4. Track Overlap

This should be checked by first making a recording on a blank tape with the unit being checked.

Do not rewind the tape, merely reverse the reels and play back the other track.

There should be no sound but, if what is heard is backwards, there is track overlap. To correct this, it will be necessary to adjust the tape guide on the side of the head holder by bending it upwards. This should move the tracks further apart.

Switch Cam Adjustment-

The Play-Record Switch in the amplifier chassis is normally held in the play position by a spring located on the switch arm. When cam on the end of the control shaft (70) actuates switch, it should move the switch far enough to allow all circuits to be switched from Playback to Record. If adjustment is required proceed as follows:

1. Loosen set screw (33).

2. Carefully detach one end of switch spring.

3. Push down on control knob (5) and turn it clockwise to the Record position.

4. Manually move switch cam (70) until first

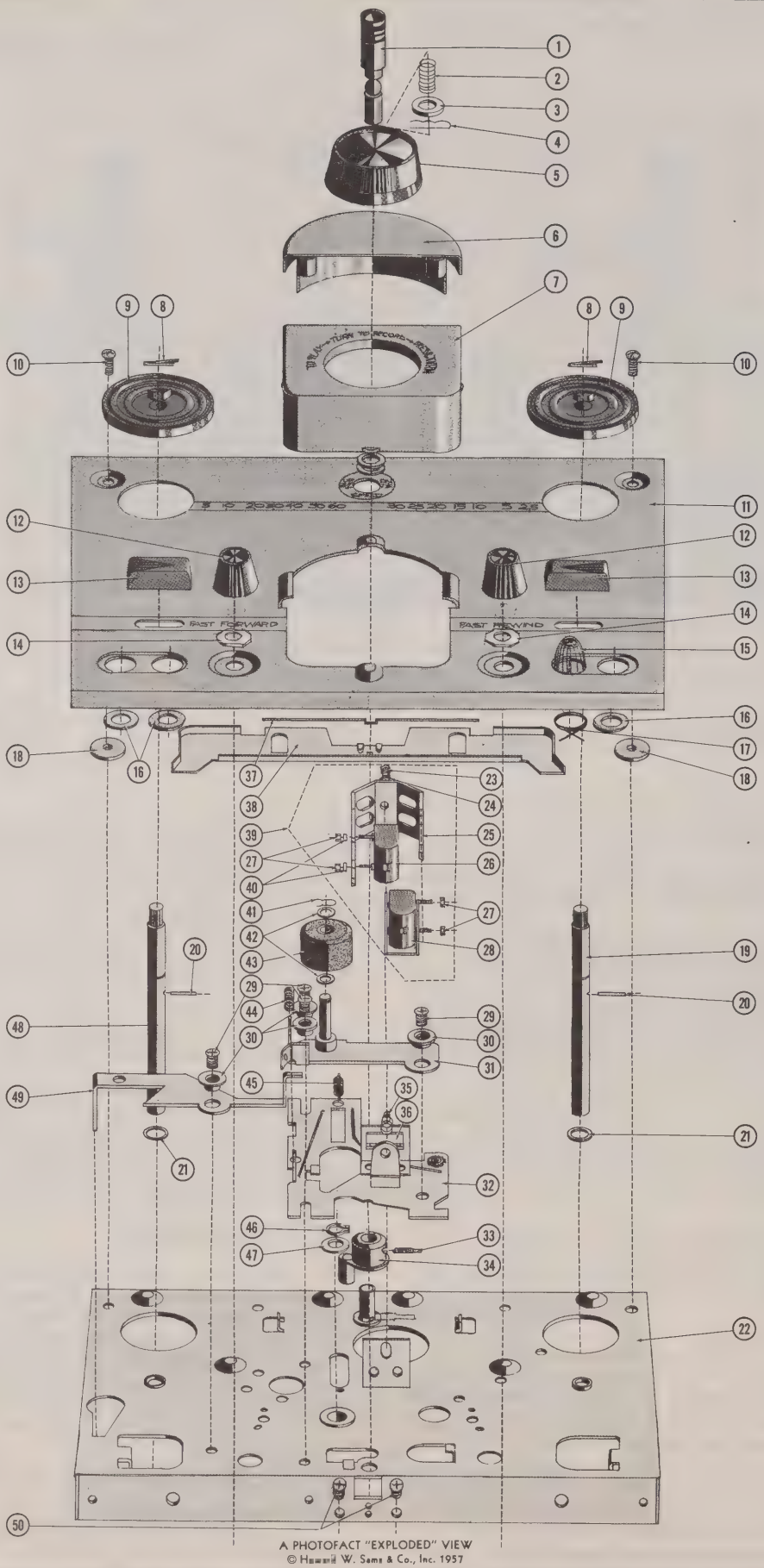


FIGURE 3A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE.

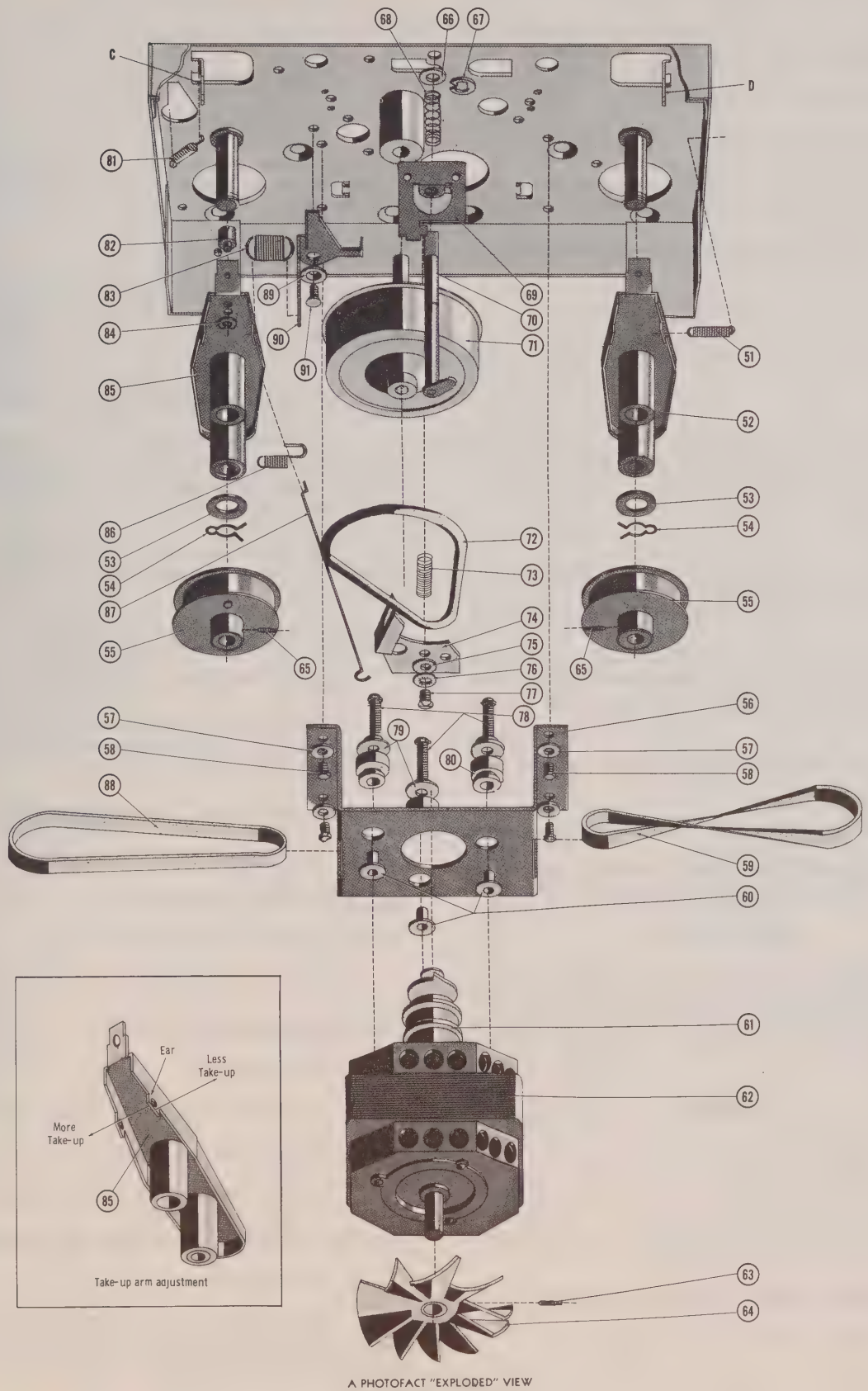


FIGURE 3B. EXPLODED VIEW OF PARTS BELOW BASEPLATE.

slide contact touches only the first two wiper contacts. At all times during this step, switch cam (70) must touch switch cam at end at switch slide.

5. Move pusher stud (34) to the "Record" position and tighten set screw (33).

6. Reconnect switch spring.

Oscillator Coil Adjustment-

If the oscillator coil (L1) is replaced, the setting of the adjustable slug should be checked as follows:

1. Connect a frequency meter between point 2 of the erase head and ground.

2. Turn volume and tone controls on.

3. Set the Play-Record knob (5) to the "Record" position.

4. Adjust the oscillator slug for a 52.5 KC reading on the meter (A non-metallic screwdriver should be used for this adjustment.)

Hum Balance-

When either the 12AX7 tube or the Head (39) has been changed, the setting of the hum balancing control should be checked. This can be done as follows:

1. Connect an A.C. V.T.V.M. across the speaker coil. The meter's lowest scale should have a .1 volt reading at full scale deflection, or at least 1/3 of full scale.

2. Turn volume control and tone control fully clockwise.

3. Set control knob (5) to the playback position.

4. Adjust the hum balance control for a minimum reading. This reading should not exceed .1 volt.

LUBRICATION

The lubrication applied at the time of manufacture should be sufficient for a long period of time. In cases of unusual use, high operating temperatures, or the replacement of a part, lubrication may be required.

TROUBLES

Improper Tape Take-Up-

1. Spindle (48) binding.

(a) Lubricate and check end play. See adjustment section "Spindle End Play".

2. Improper Take-up spring (83) action.

(a) See "Take-up Lever Adjustment".

3. Drive belt slipping.

(a) Clean pulleys.

4. Broken drive belt.

Fails To Fast Forward Properly-

1. See above except for step 2.

(a) See corresponding remedies above.

Fails To Fast Rewind Properly-

1. See above except for step 2.

(a) See corresponding remedies above. CAUTION: When replacing belt (59) be sure to give it a half-twist.

Stalling Or Binding-

1. Speed control (1l setting changed while unit is not turned on. This should be done only while motor (62) is rotating.

(a) With motor (62) turned on, try moving Speed Control (1) up and down several times.

(b) Should the above fail, try holding Fast Forward Control to the left as far as it will go, and with the other hand manually rotate Take-up Reel Spindle (48).

(c) If binding continues it will be necessary to remove unit from cabinet and free any binding action.

Speed Does Not Agree With Speed Setting-

1. Bend Speed Control Bracket (74).

(a) Straighten bracket (74) so that upper and lower fingers are equal distant from drive belt when belt is in normal operating position.

2. Broken "ears" on Drive Pulley (61).

(a) Replace entire motor (62).

Tape Creeps Out Of Tape Slot-

1. Head (93) improperly adjusted.

(a) See "Head Alignment Adjustment".

Plays Back But Does Not Record-

1. Bad component.

(a) Check voltage and resistance readings.

2. Switch slide not contacting proper terminal.

(a) See "Switch Cam Adjustment".

Does Not Completely Erase Previous Recording-

1. Bad 6V6GT tube.

(a) Replace tube. This tube may function properly as a power amplifier but not as an oscillator which is needed for erasing.

2. Bad Head.

(a) Replace head following "Head Alignment Adjustment".

SILVERTONE MODELS 8070, 8072 (Ch. 528.58010, 528.58011, 528.58030, 528.58031, 528.59040, 528.59041, 528.59060, 528.59061)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	† 1.8MK	470K	4700Ω	48Ω	48Ω	† 1.8MK	1Meg	4700Ω	48Ω
V2	12AX7	† 115K	0Ω	150KΩ	48Ω	48Ω	† 115K	231K	2200Ω	48Ω
V3	6V6GT	0Ω	48Ω	† 1400Ω	† 1000Ω	500K	TP	48Ω	270Ω	
V4	6X5GT	TP	48Ω	320Ω	TP	340Ω	TP	48Ω	20K (MIN)	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN RECORD POSITION.
† MEASURED FROM PIN 8 OF V4.
TP TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre-Amplifier	12AU7A	
V2	AF Amplifier	12AX7	

ITEM No.	USE	TYPE	NOTES
V3	Output , Bias Osc	6V6GT	
V4	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰40	300	18-31-3	AFH3-44	DO020	FP377	TMT-23	D-130	R1898*
B	■40	300		*				MT-4540	
C	▲40	300							
C2	25	25	18-52-5	PRS25V25	BBR25-25	TC26	TD-25-25	FM-0225	TVA-1205

* Non-Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

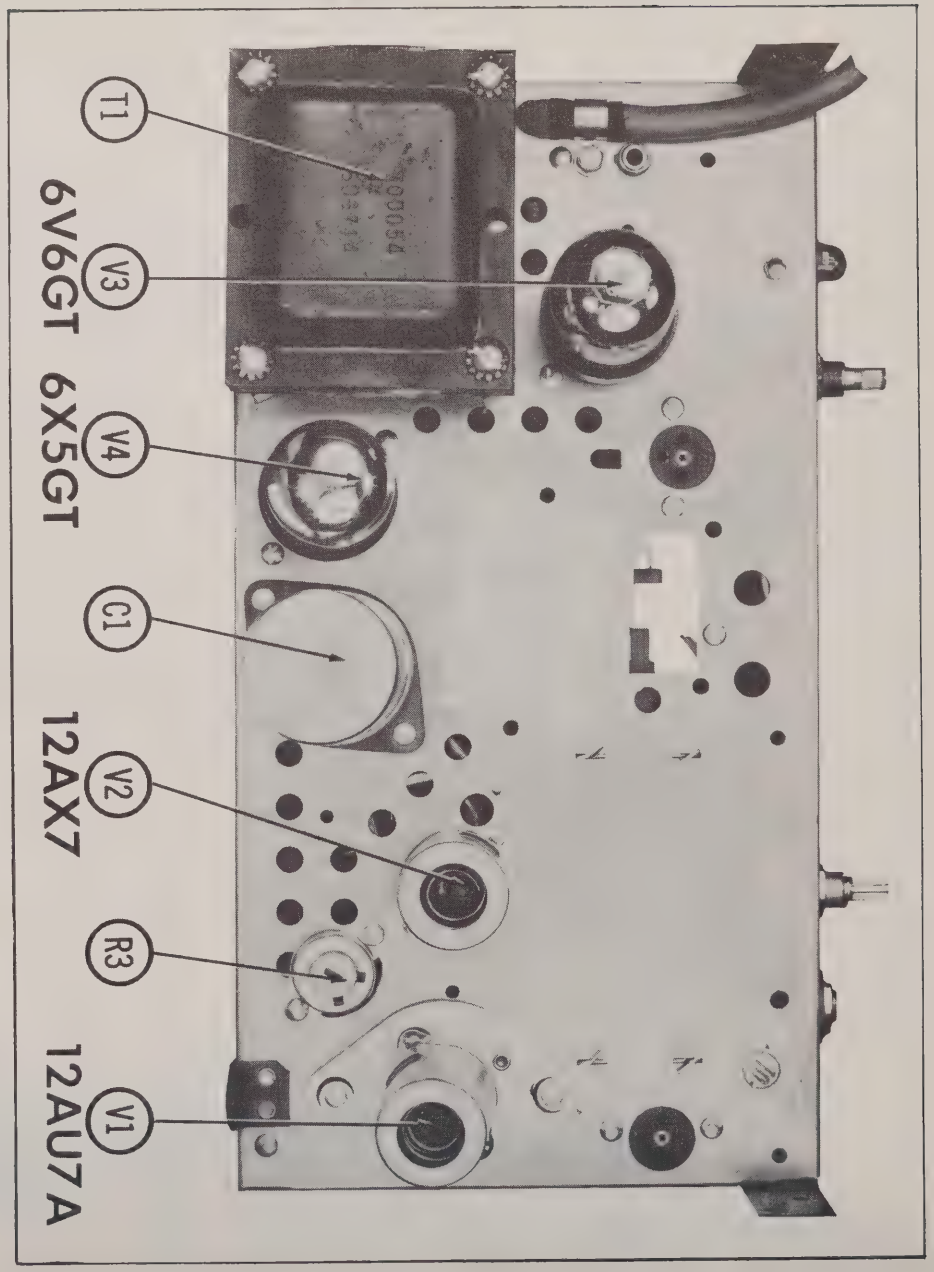
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	20000		15-20316	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C4	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	Note 1
C5	470		15-47111		D6-471	L10T47	ED-470			10%
C6	10		15-10011	NPO-SI10	DD-100	L10Q1	ED-10	ZT-541	5TCC-Q1	10%
C7	10		15-10011	NPO-SI10	DD-100	L10Q1	ED-10	ZT-541	5TCC-Q1	10%
C8	10000		15-10316	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	1000		15-10211				ED-1000			Note 2 10%
C10	20000		15-20316	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C11	470		15-47111		D6-471	L10T47	ED-470			10%
C12	120	1000	15-12111							Note 3 10%
C13	3000			1467-0003		1W5D3			1FM-23	
C14	470		15-47111		D6-471	L10T47	ED-470			10%
C15	20000		15-20316	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C16	75		15-75011	NPO-SI75	DD-750	L10Q75	ED-75			10%
C17	2000	1000	15-20226		DD-202	BYA10D2			5GA-D2	
C18	2000	1000	15-20226		DD-202	BYA10D2			5GA-D2	
C19	10000	1500	20-75-0	DAC-27		HVE16S1		GEM-1611	BL-S10	
C20	10000	1500	20-75-0	DAC-27		HVE16S1		GEM-1611	BL-S10	

① Some versions use an .01 in this application.
② In Chassis 567, 59060 a 1500 MMF @ 500V 10% GP Part #15-15211 is used in this application.
In Chassis 528, 59040 a 750 MMF @ 500V 10% GP Part #15-75111 is used.
③ In Chassis 528, 59040, 60 a 75 MMF @ 500V 10% GP Part #15-75011 is used in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	24-267-0	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	24-143-2	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R3	200Ω	2 W	24-1-3					Hum Balance Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R4	1Meg		60-10501	BTS-1Meg	
R5	470K		60-47401	BTS-470K	
R6	220K		60-22401	BTS-220K	
R7	4700Ω		60-47201	BTS-4700	
R8	470K		60-47401	BTS-470K	
R9	220K		60-22401	BTS-220K	
R10	4700Ω		60-47201	BTS-4700	
R11	100K		60-10402	BTS-100K	
R12	220K ①		60-22401 ①	BTS-270K	Note 1
R13	1500Ω		60-15201	BTS-1500	
R14	220K		60-22401	BTS-220K	
R15	100K		60-10402	BTS-100K	
R16	2200		60-22202	BTS-2200	
R17	15K		60-15302	BTS-15K	
R18	270Ω	1	60-27111	BTA-270	
R19	150K		60-15401	BTS-150K	
R20	68K		60-68301	BTS-68K	
R21	5.6Meg		60-56501	BTS-5.6Meg	
R22	560K		60-56401	BTS-560K	
R23	2.2Meg		60-22502	BTS-2.2Meg	
R24	1Meg		60-10501	BTS-1Meg	
R25	47K		60-47301	BTS-47K	
R26	10K		60-10302	BTS-10K	
R27	1000Ω	5	61-95	PW7-1000	
R28					

Note 1. Alternate Part No. 60-27401, 270KΩ Used In Ch. 567-59060 Only.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .30A	510VCT @ .040A	6.3V @ 1.7A		700054 ③	P9205①②	P-3048	PM8403①②	22R00①②	R-88①②

① Tape 5V Winding.
② Tape center tape on 6.3V Winding.
③ Alternate Part No. 80-2-0.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4600Ω	3-4Ω	700055 ①	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	013630 ①	52A21	① Alternate Part Number 33-296-4, 33-265-4

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Bias Oscillator	10-31-4				Includes C13.

MISCELLANEOUS

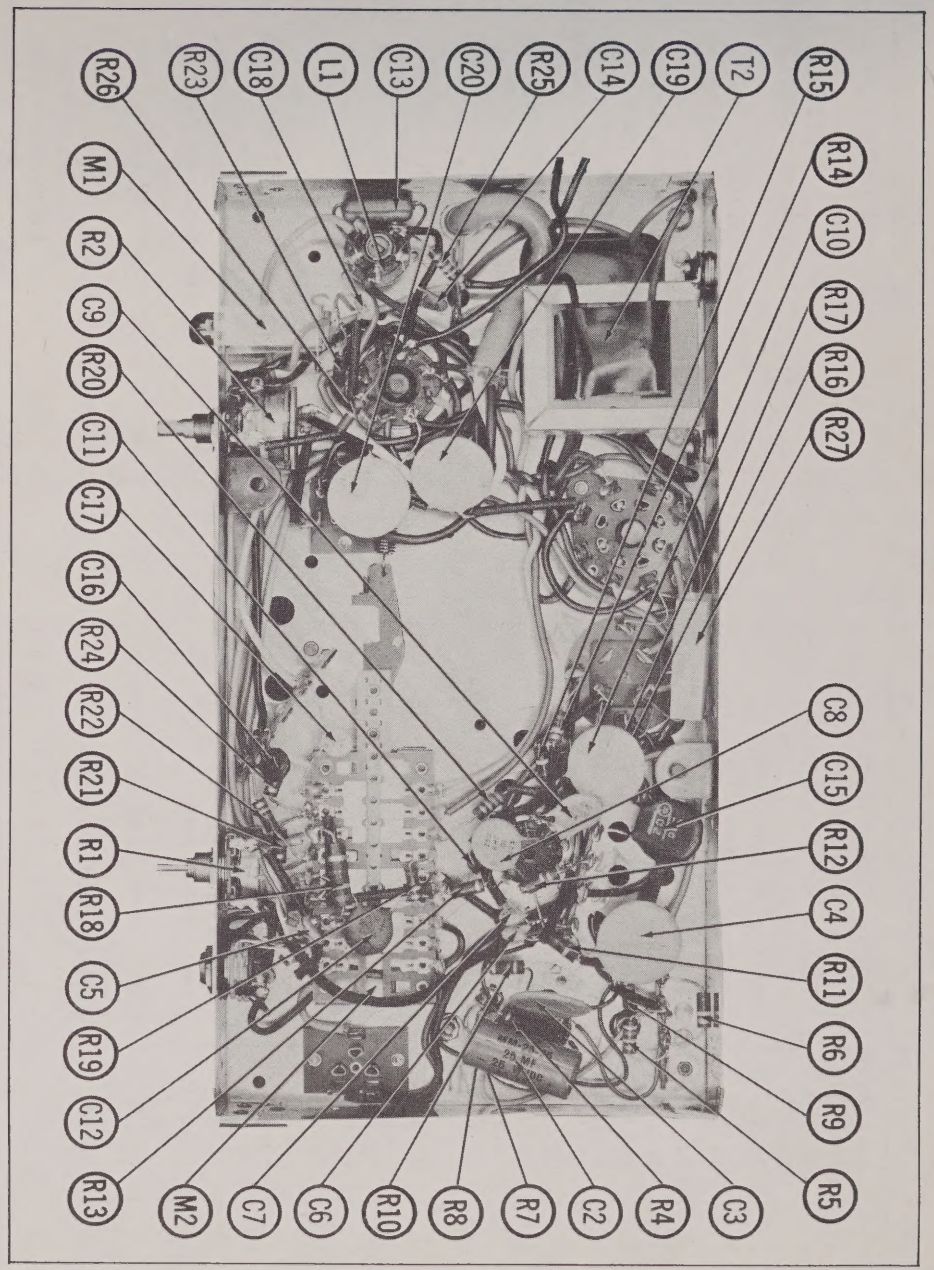
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Indicator	89-19	Type NE51
M2	Switch	69-238-0	Record & Playback (Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-845-0	On-Off-Volume (Model 8070)
Cabinet	42-12-5	W/ Lid (Model 8070)
Cabinet	42-1-5	W/ Lid (Model 8072)

CHASSIS—BOTTOM VIEW



MECHANICAL PARTS LIST

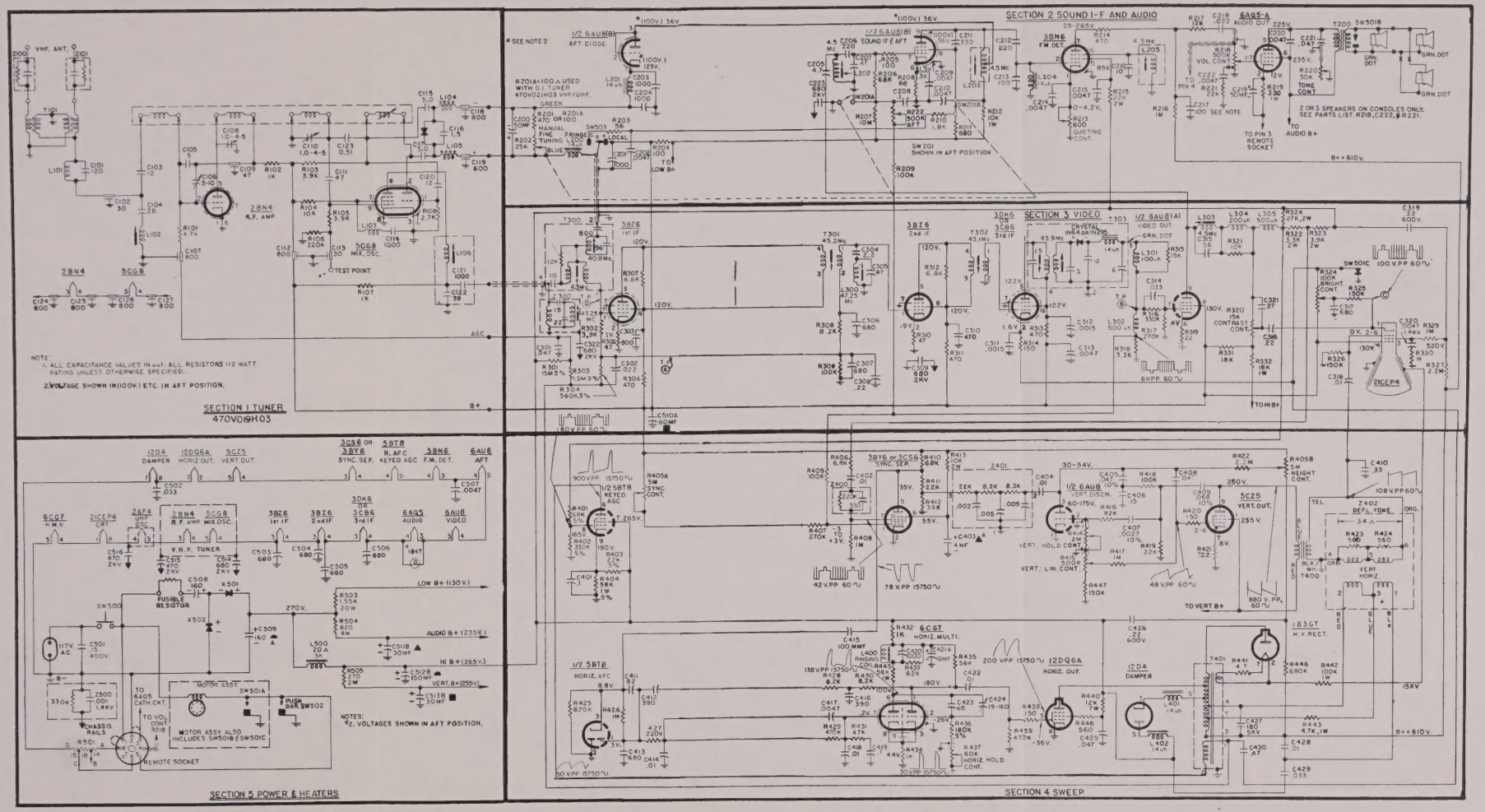
Ref. No.	Part No.	Description
1	84-3405	* Plunger Knob & Shaft Ass'y.
2	70-259-0	* Compression Spring
3	86-270	* Flatwasher, Rubber 5/16" I.D. x 9/16" O.D.
4	70-256-0	* Spring, Plunger Detent
5	52-846-0	† Knob, Play-Record (U
	52-779-0	* Knob, Play-Record
6	84-3781	† Head Cover
	21-337-0	* Head Cover
7	21-141-0	† Cover, Pressure Roller
	21-338-0	* Cover, Pressure Roller
8	22-41-1	† Retainer Spring (2)
	22-110-0	* Retainer Spring (2)
9	83-1127	† Reel Plate (2)
	84-3381	* Reel Plate
10	97-569	Screw, #6-32 x 1/4" Phil. Pan Hd. (2)
11	84-3780	† Top Plate Ass'y.
	84-3296	* Top Plate Ass'y.
12	52-845-0	† Knob, Volume & Off/On-Tone
	52-781-0	* Knob, Volume & Off/On-Tone
13	52-844-0	† Knob, Fast Forward & Fast Rewind (2)
	52-782-0	* Knob, Fast Forward & Fast Rewind (2)
14	56-230	Hex Nut, #3/8-32 (2)
15	48-138-2 or	Jewel, Neon Lamp
	48-139-2	Jewel, Neon Lamp (Alternate Part)
16	86-265	* Flatwasher, Fiber (1)
17	22-120-0	Retainer Spring
18	86-273	* Flatwasher, .176" I.D. x 5/8" O.D. (2)
19	84-3404	Spindle Ass'y.
20		Roll Pin (2)
21	86-280	Flatwasher, .315" I.D. x 1/2" O.D. (4)
22	84-3800	† Base Plate, Includes Staked & Riveted Parts
	84-3421	* Base Plate, Includes Staked & Riveted Parts
23	97-575	Head Retaining Screw
24	86-294	Washer, Flat
25	11-1048	Bracket, Head Mounting
26	33-271-0	Record Head (MM #3M-20) (Used In Chassis 528.58031-528.58011 — 567.58031)
27	56-234	Hex Nut (4)
28	33-270-0	Erase Head (MM #7EM-12) (Used In Chassis 528.58031-528.58011 — 567.58031)
29	97-573	Screw, #6-32 x 1/4" Phil. Flat Hd. (4)
30	72-135	Washer, Slide Button (4)
31	84-3408	Pressure Roller Arm
32	84-3458	Pressure Plate & Spring Ass'y.
33	97-577	Set Screw, #6-32 x 3/8" "Slab Hd."
34	84-3409	† Lifter Arm & Set Screw Ass'y.
	84-3399	* Lifter Arm & Set Screw Ass'y.
35	70-253-0	Spring, Pressure Shoe
36	84-3401	Pressure Shoe Ass'y.
37	70-249-0	* Spring, Brake Lever
38	28-112-1	* Brake Plate
39	84-3403	Head Ass'y. (Used In Chassis 528.58030 — 528.58010 — 567.58030)
	84-3418	Head Ass'y. (Used In Chassis 528.58031 — 528.58011 — 567.58031
40	86-295	Flatwasher, .092" I.D. x 7/32" O.D. (Part of 84-3403 Head Ass'y.)
41	22-40-1	Retainer Spring
42	86-282	Washer, Cloth (2)
43	39-1-5	Pressure Roller
44	70-258-0	Spring, Pressure Roller
45	70-251-0	Spring, Slide Return
46	22-37-1	Split Ring Retainer
47	86-280	Flatwasher, Capstan & Flywheel
48	84-3404	Spindle Ass'y.
49	22-15-4	* Lever, Foot Switch
50	97-569	Screw, #6-32 x 1/4" Phil. Bd. Hd.
51	70-252-0	Brake Spring (Right)
52	84-3419	Feed Reel Arm Assembly
53	86-289 or	Flatwasher, .440" I.D. x 11/16" O.D.
	86-290	Flatwasher, .440" I.D. x 11/16" O.D.
54	22-42-1	Hairpin Retainer (Large)
55	84-3413	Spindle Pulley & Set Screw Ass'y. (2)
56	84-3407	Bracket, Motor & Lug Ass'y.
57	86-294	Flatwasher, .188 "I.D. x 7/16" O.D. (4)
58	97-567	Screw, #8-32 x 3/16" Hex. Hd.
59	62-78-0	Drive Belt
60	65-123	Eyelet (3)
61		Drive Pulley (Part of Motor)
62	84-3456	Motor, Plug & Pulley Ass'y.
63	97-619	Set Screw, #8 x 3/16" "Allen Hd." Cup. Pt.
64	84-4240	Fan, Hub & Set Screw Ass'y.
65	97-577	Set Screw, #6-32 x 3/8" "Slab Hd." Cone Pt.
66	86-288	Washer, Rubber
67	22-38-1	"E" Washer, Retainer
68	70-260-0	Record Release Spring
69	11-1046	Control Shaft Bracket
70	84-3410	Control Shaft & Lever Ass'y.
71	84-3466	Capstan Shaft & Flywheel Ass'y.
72	62-79-0	Flywheel Belt
73	70-259-0	* Spring, Two Speed Control (Lower)
74	22-14-4	* Speed Control Bracket
75	86-284	* Washer, Flat
76	86-45	* Lockwasher
77	97-569	Screw, #6-32 x 1/4" Phil. Pan Hd.
78	97-574	Screw, #8-32 x 5/8" Hex. Hd. Motor Mounting (3)
79	86-293	Washer, Motor Mounting (3)
80	62-74-0	Rubber Bushing, Motor Mounting (3)
81	70-244-0	* Return Spring, Foot Switch
82	39-1-0	* Cam, Foot Switch Adjustment
83	70-250-0	Take-up Spring
84	22-46-1	* Retainer, Foot Switch Adjust. Cam
85	84-3420	Reel Arm Take Up Ass'y.
86	70-257-0	Brake Spring (Left)
87	39-5-3	Foot Switch Linkage Rod
88	62-78-0	Drive Belt, Take-Up
89	72-135	Washer, Slide Button Spacer
90	22-13-4	Take Up Lever
91	97-573	Screw

† Parts Marked With Dagger Used In Model 8070.

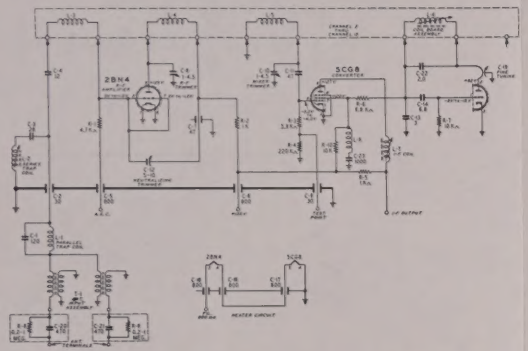
* Parts Marked With Asterisk Used In Model 8072.

WESTINGHOUSE MODELS	CHASSIS
H21K223	V-2372
H21K224	"
H21K225	"
H21K226	"
H21K227	"
H21K228	"
H21K229	"
H21K232	"
H21K233	"
H21KU223	V-2382
H21KU224	"
H21KU225	"
H21KU226	"
H21KU227	"
H21KU228	"
H21KU229	"
H21KU232	"
H21KU233	"
H21T218,A	V-2372
H21T220, A	"
H21TU218, A, B, C	V-2382
H21TU219, A, B, C	"
H21TU220, A, B, C	"
H21TU221, A, B, C	"
H21TU222, A, B, C	

SCHEMATIC COURTESY OF
WESTINGHOUSE ELECTRIC CORP.

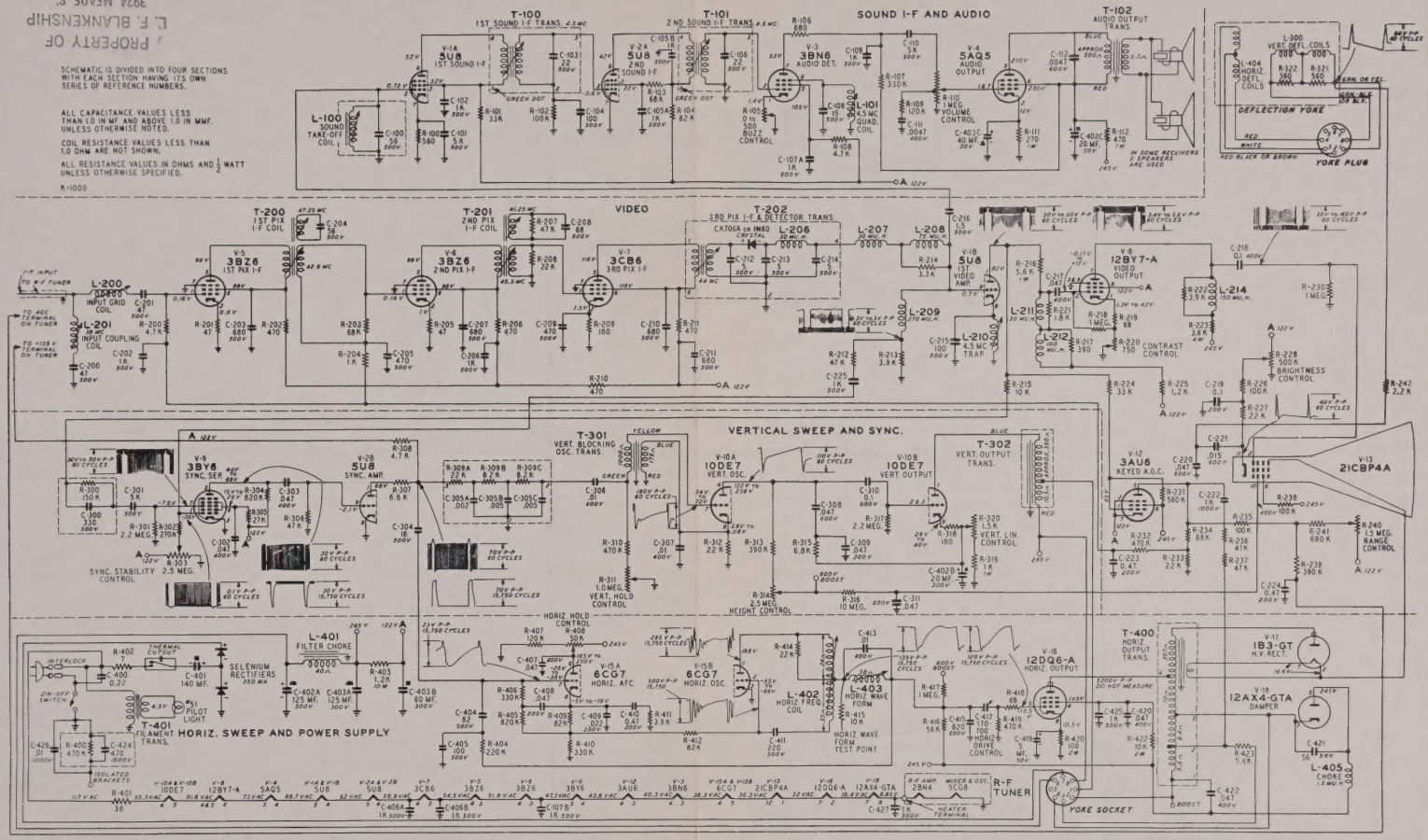


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CORONADO
MODELS
TV2-9485A
TV2-9486A

SCHEMATIC COURTESY OF
GAMBLE-SKOGMO, INC.


SCHEMATIC IS DIVIDED INTO FOUR SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS.
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.
COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.
ALL RESISTANCE VALUES IN OHMS AND 1/2 WATT UNLESS OTHERWISE SPECIFIED.
K-1000
SOUND I-F AND AUDIO
VIDEO
VERTICAL SWEEP AND SYNC.
HORIZ. SWEEP AND POWER SUPPLY
R-F TUNER
YOKE SOCKET
DEFLECTION YOKE
YOKE PLUG

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